REPORT RESUMES

ED 003 399 24

AN ANALYSIS AND PROJECTION OF RESEARCH IN TEACHER EDUCATION.
BY- CYPHERT, FREDERICK R. SPAIGHTS, ERNEST
OHIO STATE UNIV., COLUMBUS, RESEARCH FOUNDATION
REPORT NUMBER CRP-F-015 PUB DATE 64
EDRS PRICE MF-$0.45 HC-$12.96 324P.

DESCRIPTORS- *TEACHER EDUCATION, EDUCATIONAL RESEARCH, CONFERENCES, RESEARCH METHODOLOGY, *RESEARCH OPPORTUNITIES, RESEARCH PROBLEMS, COLUMBUS, OHIO

A CONFERENCE WAS HELD IN COLUMBUS, OHIO, ON MARCH 29 THROUGH APRIL 3, 1964, WHICH WAS DIVIDED INTO 3 PARTS. PART ONE, LASTING 2 DAYS, WAS A REVIEW AND ANALYSIS OF THE EXISTING RECENT RESEARCH IN THE FIELD OF TEACHER EDUCATION AS THAT FIELD HAS BEEN TRADITIONALLY DEPRIVED. PART TWO, LASTING 2 DAYS, ATTEMPTED TO STRETCH THE NORMAL BOUNDS PLACED ON THE DEFINITION OF RESEARCH IN TEACHER EDUCATION. PART THREE, WHICH WAS 1 DAY, CENTERED AROUND ACTIVITIES OF RANDOM SUBGROUPS OF PARTICIPANTS WHOSE TASKS WERE TO DELINEATE ISSUES AND ALTERNATIVES NOT FULLY DEVELOPED IN THE DISCUSSIONS OF THE TOTAL GROUP. SEVERAL REPORTS, COVERING THE ISSUES OF THE CONFERENCE, ARE INCLUDED UNDER THE FOLLOWING HEADINGS--(1) A BRIEF ANNOTATED BIBLIOGRAPHY OF RECENT RESEARCH IN TEACHER EDUCATION, (2) STATUS OF RESEARCH IN TEACHER EDUCATION, AND (3) PROJECTION OF RESEARCH IN TEACHER EDUCATION. (HB)

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education
This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

Accepted
1-7-65

AN ANALYSIS AND PROJECTION OF RESEARCH IN TEACHER EDUCATION

COOPERATIVE RESEARCH PROJECT NO. F-015

FREDERICK R. CYPHERT
PROJECT DIRECTOR

ERNEST SPAIGHTS
RESEARCH ASSOCIATE

COLLEGE OF EDUCATION

THE OHIO STATE UNIVERSITY RESEARCH FOUNDATION
COLUMBUS, OHIO

1964

THE INFORMATION REPORTED HEREIN WAS SUPPORTED BY THE COOPERATIVE RESEARCH PROGRAM OF THE OFFICE OF EDUCATION, U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE.

ED 003399

ACKNOWLEDGMENTS

Like most research endeavors, this project has been a cooperative venture which has benefited from the talents, efforts, and ideas of many persons. In addition to the support from the Cooperative Research Branch of the U. S. Office of Education, the following persons have made substantial contributions to this work.

Thanks should be given first to Dr. David L. Clark who spent many months bringing the project to fruition. His leadership and insightful contributions, too numerous to specify, pervade the total project. Dean Donald P. Cottrell provided needed encouragement and a personal knowledge of the expertise of consultants and participants. Many activities of the Conference were materially sharpened through the ideas of Dr. Karl Openshaw. Special thanks are due Mr. L. O. Andrews for his assistance in editing this manuscript.

Two other persons who deserve mention are Frank Ewing and Norman Overly who assisted the project staff by supervising the recording of the Conference deliberations, caring for the personal needs of the participants, and performing innumerable spur-of-the-moment tasks.

The personal appreciation of the research staff is extended to Mrs. Kay Wagner who spent many exhausting hours in expertly executing the secretarial chores associated with the project.

Finally, we are deeply indebted to those noted educators who gave so unstintingly of themselves by attending the Conference and approaching its activities with enthusiasm, humility and determination.

Frederick R. Cyphert

Ernest Spaights

TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS i

Chapter
I. THE OBJECTIVES AND ORGANIZATION OF THE STUDY

Rationale 1
The Project 5
The Report 7

II. AN ANNOTATION OF RECENT RESEARCH IN TEACHER EDUCATION

Historical Development, Scope, Functions and Objectives of Teacher Education 12

Organization and Administration of Teacher Education 14

College Faculty and Staff Personnel 21

Curriculum Offerings in Teacher Education Institutions 25

Instruction and Field Experience in Teacher Education Programs. 35

Student Personnel in Teacher Education 62

Teachers and The Profession of Teaching 88

III. STATUS OF RESEARCH IN TEACHER EDUCATION

Research in Teacher Education: Problems, Analysis and Criticism 103
B. Othanel Smith and Milton Meux

Some Strengths and Weaknesses of Research Methodology in Teacher Education 123
Raymond O. Collier, Jr.

Impact of the Research Upon the Practice of Teacher Education 149
L. D. Haskew

Chapter Page

IV. PROJECTION OF RESEARCH IN TEACHER EDUCATION

Educational Theory Models: A Possible Way to Stretch the Bounds of Teacher Education Research 174
Elizabeth Steiner Maccia

Interaction Models of Critical Teaching Behaviors . . 197
Ned A. Flanders

The Utilization in Education of Knowledge Derived from Research on Learning 219
Robert M. W. Travers

Some Implications of Recent Instructional Media Research for the Professional Education of Teachers 253
C. Walter Stone

V. CONSPECTUS

Research Status 295
Research Targets 298
Research Process 307
Conclusion 312

APPENDIX

CONFERENCE CONSULTANTS, PARTICIPANTS, AND OBSERVERS 315

CHAPTER I

THE OBJECTIVES AND ORGANIZATION OF THE STUDY

Rationale

The project and culminating conference reported in this document can be understood most clearly in terms of the Gestalt from which it grew. Pre-eminent among the many problems with which teacher education today is fraught is its inability to provide for its own systematic improvement. The extant research in teacher education is neither extensive nor profound. As Stinnett and Clarke state, "In spite of increasing criticism of the nation's procedures for the education of teachers . . . there has been remarkably little basic research in teacher education during the past decade."[1] Colardarci reiterates this conclusion by saying, "Any systematic and disinterested examination of the research relating to teacher education will suggest that strong knowledge claims are not possible."[2]

Existing teacher education research has had only a minimal impact upon teacher preparation curricula. Current teacher education content and method have been generated almost exclusively on logical grounds without explicit empirical reference to a clear definition of criterion behavior. In an article entitled "Neglected Areas in Educational Research," John Carroll writes, "Consideration of what things should be taught to prospective teachers and what actions they should take as teachers sometimes seem (sic) to proceed as if educational research never existed."[3]

Coladarci fortifies this concept when he concludes, ". . . the contents and procedures of teacher education frequently have no demonstrable relevance to the actual teaching task."[4] Since little of the substance of teacher education is related to research, it has neither been empirically validated nor refuted.

When one peruses the changes made in teacher education over the past ten years, or projects ahead for the next decade, he is struck with the undeniable evidence that virtually all of those who are planning the "improvement" of teacher education are operating, and are likely to continue to operate, by applying their subjective insights, hunches, and hypotheses growing out of experience to reorganizing portions of their programs. They have neither pre- nor post-innovational empirical data concerning the validity of their changes. The fact that most efforts to improve the preparation of teachers are superficial in a research context, and that new knowledge is ignored or is missing altogether, makes little sense in light of widespread dis-satisfaction with the state of the art. Too long too many teacher educators have enjoyed the comfort of opinion without the discomfort of evidence.

An additional contention is that research in teacher education has been so narrowly conceived and defined as to exclude from study perhaps the most important elements of the education of teachers. A review of the teacher-education section of the Encyclopedia of Educational Research and the "Research and Study in Teacher Education" issues of the AACTE Bulletin indicates that teacher education research has been circumscribed traditionally to include only: (1) historical development, scope, functions, and objectives of teacher education; (2) organization and administration of teacher education; (3) college faculty and staff personnel; (4) curriculum offerings in teacher education institutions; (5) instruction and field experience in teacher education programs; (6) student personnel in teacher education; and (7) teachers and the profession of teaching.[5]

Much of the educational research which might have implications for restructuring teacher education is not integrated with the literature of teacher education. Studies concerning teaching methodology, the systematic observation of classroom behavior, instruments and media of instruction, the open and closed mind, paradigms for research on teaching, and the dynamics of group interaction are not considered to be teacher education literature. N. C. Gage's Handbook of Research on Teaching[6] serves as an excellent example of compilations of research that should be at the heart of the study of teacher education, but that are currently outside the usual scope of teacher education research.

Historically it appears that teacher educators have been more concerned with investigating teacher characteristics than with studying teaching behaviors. One might conclude that many teacher educators have greater confidence in the possibilities of eliminating potentially poor teachers from preparation programs than they have in their own ability to increase knowledge of teaching skills and how future teachers can acquire them.

Many would contend that teacher education research has been approached in the main in an unimaginative fashion and with no communicable conceptual frame of reference. These studies have little heuristic value.

Since teacher education research fails to achieve conceptual interlock, that is, it has not been and could not be put together into a functional discipline, it has had little impact upon the product of teacher education institutions. One might well hypothesize that new knowledge may not be essential or wanted if teacher educators are completely absorbed with questions such as the control of teacher certification rather than with questions about what teachers do and should learn to do. Perhaps this concern with the tangible periphery is why teacher educators have not investigated and assimilated data of foundational value; that they have sought to improve teacher education rather than to understand it.

The dilemma facing scholar-educators who are concerned with the preparation of teachers was succinctly described by Harry Boudy at a recent meeting of the Advisory Council, Associated Organizations for Teacher Education:

> Thus it is that when our critics utter distasteful generalizations about Educationism, we can only retort with instances that falsify it; we cannot, however, offer a counter-generalization which is true; that is why, even though we disprove each false generalization separately, we cannot deny the basic attack which is that no generalizations are possible. And where no generalizations are possible, no excuse exists for a college or school of education; certainly not on the graduate level.[7]

How does the profession move to solve the dilemma of building effective programs for preparing teachers when little evidence exists? Certainly the exchange of general views concerning the state of the art and the defending and extending of organizational or manipulative approaches to the education of teachers has proven ineffective. With due regard to those facets of existing programs which appear to assist prospective teachers, the time has come to face the problem of providing a continuing flow of new knowledge pertinent to teacher education so that not only may the preparation of teachers be understood and systematically and demonstrably improved, but also that the substance of teacher preparation can be reconstituted and redefined through this empirically validated strong knowledge.

As Smith so well stated, "The question of what knowledge is relevant to the control of teaching behavior is an empirical one, because teaching is a natural social phenomenon. It has its own forms, its own constituent elements, its own regularities, and its own problems. It takes place under a stable set of conditions--time limits, authority figures, systems of knowledge, social structures, psychological capacities, etc. If we would understand teaching and thereby gain control over it we must first study it in its own right."[8] Truisms that certain facets of teaching are unpredictable and creative and involve the tools of the artist without the tools of the scientist, or that some of the substance of extant teacher education curricula is producing positive results, or that research is not the sole avenue to improving teacher education, do not negate the need for an immediate projection of the roles which educational research efforts could and should play in the area of teacher education.

The Project

An attempt to evolve valid and comprehensive schema for identifying or guiding needed modifications in the scope, direction, and procedures of research relating to the education of teachers is essential. A current critical analysis of recent teacher education research and its adequacy is likewise required. Consequently, this project entailed the development and execution of an effort to rectify the present void through bringing together distinguished teacher educators and research scholars in professional education. This conference had as its purposes appraising the progress that has been made in research in teacher education; developing guidelines for future research; and conceiving new approaches to selected research problems and issues in teacher education.

The conference, held in Columbus, Ohio, on March 29 through April 3, 1964, was divided into three parts. Part I, lasting two days, was directed toward a review and analysis of the existing recent research in the field of teacher education as that field has been traditionally defined.

The conference staff prepared a staff paper which surveyed, organized, and annotated the bulk of the published research efforts in teacher education for the past several years. This paper was distributed to conference consultants and participants well in advance of the Columbus meeting.[9] This paper and many of the original studies annotated therein were used as a basis for analyzing the research effort in teacher education from three points of view: (1) B. O. Smith wrote in terms of the theoretical and logical underpinnings of research in the field--what implicit and explicit assumptions have been employed by researchers; (2) Ray Collier studied from the vantage point of research methodology, i.e., the strengths and weaknesses of the research strategies and designs which have been employed in investigating teacher education; and (3) finally, Lawrence Haskew criticized from a pragmatic view, i.e., what impact has the research had on the practice of teacher education. All persons attending had ample opportunity to react to each presentation for clarification, extension, or agreement.

Part II of the conference, lasting another two days, attempted to stretch the normal bounds placed on the definition of research in teacher education. Four papers were presented at that time, each of which took a block of research in education with apparent but undeveloped implications for teacher education and sought to: (1) make explicit the implications of this research for the education of teachers; and (2) project the possibilities for pursuing research in teacher education employing the substance and research methods of these areas. To fulfill this purpose Robert Travers presented a review of research in learning theory, Ned Flanders analyzed the potential of classroom structure and teacher-pupil interaction, Elizabeth Maccia discussed the contributions of educational models and theories, and C. W. Stone spoke of research in instructional media. These presentations were also followed by vigorous debate and discussion.

The third phase of the conference, which developed throughout the meeting and culminated on the final day, centered around the activities of random sub-groups of participants. Their task was to delineate issues and alternatives not fully explicated in the discussions of the total group and to develop guidelines for inclusion in the message eminating from the conference.

The Report

This manuscript, insofar as possible, attempts to report rather than to interpret the activities of the project. The papers comprising

Chapters II, III, and IV are included as written by the respective authors without further editing. The outcomes of the deliberations, which comprise Chapter V, have been extracted from tape recordings of the total preceedings. While no statements therein represent direct quotations, a serious attempt was made to remain true to the intent of the discussants.

The reader is cautioned to remember several factors when considering the content of this report. First, these were rather ambitious tasks to complete in the six months' duration of the study and the five days devoted to the conference, and they naturally were too complex to permit perfection. Second, the conference participants, while all persons of considerable academic stature, represented a variety of professional backgrounds and interests. Differences in vocabulary, areas of expertise, and philosophic orientation were barriers preventing complete consensus on most issues. Third, the project staff exercised prudent but not faultless judgments in selecting the thoughts extracted from the discourse for highlighting.

The ideas reported herein should be considered as hueristic, suggestive, and exploratory rather than as definitive findings representing a validated blueprint for action. As such they may open up possibilities for the process and substance of research from which can flow an ever increasing stream of new strong knowledge leading to better ways to educate teachers.

BIBLIOGRAPHY AND NOTES

1 Stinnett, T. M., and Clarke, Charles M. "Teacher Education--Programs," in *Encyclopedia of Educational Research*, Chester W. Harris, editor, New York: Macmillan Company, 1960, p. 1461.

2 In Sarason, Seymour B., Davidson, Kenneth S., and Blatt, Burton. *The Preparation of Teachers: An Unstudied Problem in Education*. New York: John Wiley & Sons, Inc., 1962, p. vii.

3 Carroll, John B. *Phi Delta Kappan*, May, 1961, 42,343.

4 *Op. cit*., p. vii.

5 *Op. cit*., and *The American Association of Colleges for Teacher Education Bulletin*. Washington, D. C.: The Association, 11, Nos. 8 and 14; 12, Nos. 4 and 5; 13, No. 2; 14, No. 5; 15, No. 8.

6 Chicago: Rand McNally & Company, 1963.

7 *The Education of Teachers*. University of Illinois, May, 1962, p. 7. (mimeographed)

8 *Knowledge About Knowledge for Teachers*. University of Illinois, 1961, p. 2. (mimeographed)

9 Consultants were selected because of obvious interest and competency in the topic each presented. Participants were invited because of their diversity of areas of expertise and commonality of professional accumen. A list of both consultants and participants is included in Appendix A.

CHAPTER II

AN ANNOTATION OF RECENT RESEARCH IN TEACHER EDUCATION

Frederick R. Cyphert, The Ohio State University
and
Ernest Spaights, The Ohio State University

Introduction

This paper is an attempt to survey, summarize, and annotate examples of the research efforts in teacher education for the past ten years. It was the intention to classify these research studies according to traditional categories. Toward this end, the Encyclopedia of Educational Research and the "Research and Study in Teacher Education" issues of the AACTE Bulletins were examined. These sources indicated that teacher education research has been circumscribed traditionally to include: (1) historical development, scope, functions, and objectives of teacher education; (2) organization and administration of teacher education; (3) college faculty and staff personnel; (4) curriculum offerings in teacher education programs; (5) instruction and field experience in teacher education programs; (6) student personnel in teacher education; and (7) teachers and the profession of teaching.

In the search for studies concerned with teacher education research, a detailed investigation was made of the following sources: (1) journals which typically publish research in teacher education, (2) Dissertation Abstracts, (3) U. S. Office of Education studies, (4) yearbooks of professional organizations, (5) known researchers in the field of teacher education, (6) data retrieval services (Western Reserve University and the Smithsonian Institution), and (7) professional organizations associated with teacher education.

The list of studies presented here does not exhaust the delimited field, although it does incorporate the bulk of its content. The investigators believe they have sampled broadly and wisely enough for the paper to reflect the true nature of the extant universe of traditionally defined teacher education research.

In preparing the summarized annotations presented in this paper, the aim was to be unbiased and non-critical. It must be mentioned, however, that the reviewers used subjective judgment in the selection of the studies to be abstracted. For example, studies concerned primarily with teacher behavior and teacher effectiveness were excluded from this compilation because these studies have not been defined traditionally as teacher education research. In addition, when the reviewers were confronted with an extensive report of research, an attempt was made to include only those portions of the study which would give the general flavor of the research and yet not distort the investigator's purpose, methodology, and findings and conclusions. Every effort was made to remain true to the author's own thoughts--and often his own words. Each summary contained herein was not intended as an abbreviated substitute for the original study, but as a possible stimulant for the reader to examine the original study.

There were a number of studies which were difficult to classify because they relate to more than one of the traditional categories. When this situation arose, the reviewers examined critically the implications of the study and on this basis categorized the research in the most appropriate area.

CUMMINS, Robert E. "Role Study in Teacher Training: A Sequel", JOURNAL OF EDUCATION SOCIOLOGY, Volume 35, November 1961, pp. 119-120.

The purpose of this study was to determine what effect the teacher training program at Arkansas A and M College had on the theoretical orientation of teacher candidates. The instrument used was a fifty-one item Teacher Role Sort. The instrument includes three purpose items forming a continuum of teaching biases ranging from "freeing" through "guiding" to "molding" concepts of teaching. The remaining forty-eight items form three continuum-type groups of sixteen behaviors. The A and M staff recognizes a bias in favor of the freeing concept of teaching. It was found that the descriptive sort of the teaching role cherished by the beginning freshman did not correlate significantly with the descriptive sort delineating the bias of the institution. The Pearson product coefficient was 0.11. The descriptive sort delineated by senior students culminating their teacher training at A and M with student teaching correlated 0.45 with the institutional description. The coefficient was significant at 0.01 level. It was concluded that the professional training of these students influenced their theoretical orientation to a statistically significant degree.

JOYCE, Bruce R. "The Social Climate of Teacher Education", THE JOURNAL OF TEACHER EDUCATION, Volume 14, June 1963, pp. 179-183.

This study was designed as an inquiry into attitudes surrounding students at Wayne State University. Twenty graduating seniors were the subjects of the study. The students were asked to identify their close associates and teachers. They were then asked to react to two attitude inventories as they believed these teachers and associates would. Two instruments were used for the study. One inventory, the "Scale for Determining Teacher Beliefs", yields progressive (P), community centered (C), and academic (A) scores. A low score on any of the sections of the inventory indicates relative acceptance of a particular philosophy. The second instrument, the "Educational Viewpoint Inquiry", contained twenty-four items concerned with modern and traditional education practices. Perceived of students scores were obtained for fifty-seven college instructors and forty-eight cooperating teachers. With the use of the t-test of significance, the average "P" and "C" scores for cooperating teachers were significantly ($P < 0.001$ level) more accepting than were scores for instructors. Perceived scores were obtained for thirty fellow education students. These students were asked to respond to the "scale" only. The mean "P" and "C" scores were not significantly different from those of instructors. The "A" scores were more accepting than those of the faculty members ($P < 0.02$). It was concluded that preservice teachers feel their associates, instructors, and cooperating teachers have differing educational beliefs.

KLINE, Frances F. "Student Teacher Reactions to the Aims of Education", **PEABODY JOURNAL OF EDUCATION**, Volume 39, November, 1961, pp. 75-80.

The purpose of this study was to determine the attitude of student teachers to the aims of education as they saw them after one semester's experience in the classroom. One hundred thirty-nine seniors (79 elementary; 60 secondary) were requested to complete a checklist-questionnaire at the end of the semester in which they did their student teaching. It was found that student teachers felt that the beginning teacher should be helped to realize the aims of education; every lesson should be geared to worthwhile aims; and the aims of the school should be publicized.

ORGANIZATION AND ADMINISTRATION IN TEACHER EDUCATION

CALSON, Elsie C. "A Co-Ordinated Plan of Organization and Administration of Certain Phases of Teacher Education for All Departments of Virginia State College Concerned With the Preparation of Teachers", Unpublished doctoral dissertation, Pennsylvania State University, 1960.

The purpose of this study was to formulate a plan of organization and administration of teacher education for Virginia State College. The procedures used were intensive study of committee reports, reviewing related literature from 1925-1959, deriving statements of principles from Standards and Guide for Accreditation of Teacher Education (NCATE), and constructing a questionnaire which was sent to land grant colleges in the United States. The following committees were proposed as a result of the study: Faculty Co-ordinating Council, a Guidance Committee, a Curriculum Committee, and a Student Teaching Committee. The faculty council would be composed of heads of departments of education with representation from areas concerned with the subject matter preparation of teachers. The Director of the School of Education would chair this council.

CHABE, Alexander M. "Improving the Administration of Off-Campus Student Teaching", THE PEABODY JOURNAL OF EDUCATION, Volume 39, February 1961, pp. 31-35.

The purpose of this study was to determine administration practices in student teaching with the idea of improving the program at Park College (Missouri). A review of the literature concerned with student teaching administration produced 95 principles. A ballot form of these principles was presented to 15 selected jurors. Seventeen most significant principles were finally selected and made into a questionnaire. The questionnaire was sent to 23 Missouri institutions and all were returned. There were 20 usable questionnaires. It was found that in 17, or 85 percent, of the institutions, written policy statements governed the operation of the off-campus student teaching programs; in 12 (60 percent) there was a verbal understanding between the college and the school system; classroom visitation of teachers was the practice in all institutions; no institutional budgetary allocation was made to the off-campus elementary student teaching program; 50 percent did follow-up studies of graduates. It was concluded that formulation of policy, evaluation of existing programs and development of plans were not the joint responsibility of colleges, school systems, and students.

HALDEMAN, Carl Godfrey. "Practices and Criteria in Selecting Cooperating Schools and Teachers in Programs of Off-Campus Student Teaching," Unpublished doctoral dissertation, University of Missouri, 1960.

The purpose of this study was to determine practices in the election of off-campus cooperating schools and supervising teachers. Data for the study were obtained from information forms returned by directors of student teaching in selected colleges and universities in the North Central Area and those returned by a jury of outstanding teacher educators. It was found: (1) that two-thirds of the students attending the institutions studied do off-campus teaching; (2) two-thirds of the directors and three-fourths of the jury favor full-time student teaching; (3) more than sixty percent of the responding institutions indicated payment of a given amount of money per student teacher. This amount was usually paid to the cooperating teacher. It was concluded that a lag exists between what directors of student teaching consider desirable and what they have placed into practice.

HARAP, Henry. "Fifth-Year Preservice Programs for Graduates of Liberal Arts Colleges," TEACHER EDUCATION SERIES, Washington: U. S. Printing Office, 1962.

The purpose of this study is to make an analysis of fifth-year preservice programs for graduates of liberal arts colleges. Questionnaires were sent to 129 institutions located in 33 states. It was found that: (1) the fifth-year preservice programs for recent and mature college graduates took five special forms; Internship teaching, intensive training, certification, Master of Arts in Teaching, and programs for retired armed services personnel; (2) approximately 75 percent of these preservice programs came into existence between 1950 and 1960; (3) fifty percent of the institutions which offered separately designed preservice programs were located in six states and the District of Columbia which require 5 years of preparation for beginning high school teachers or a fifth year within five or ten years after initial employment; (4) seven different master's degrees were conferred upon the graduates of these programs, the most common being master of arts; (5) student teaching was required in 134 programs and internship in 32 programs. Student teaching or internship were optional in 17 programs; (6) only 35 percent of the graduate courses were definitely more advanced than similar courses on the undergraduate level, and 10 percent were partially more exacting.

HARAP, Henry and MC KIE, Laura Lou. "Systematic Five-Year Programs of Teacher Education," TEACHER EDUCATION SERIES, Washington: U. S. Printing Office, 1962.

This study is an analysis of programs designed for students who are committed to a plan of five years of continuous preparation for teaching. A questionnaire was sent to 123 institutions offering fifth-year programs. It was found that: (1) nearly three-quarters of the five-year programs were concentrated in states which require an unbroken sequence of five years or a fifth year of preparation within a specified period after initial employment; (2) while the five-year programs were designed for all teaching levels, nearly 70 percent of these programs were for potential secondary school teachers; (3) the median number of semester hours required to complete the five-year program was 157; (4) the major function of 77 percent of the five-year programs was to prepare students to qualify for a state teaching certificate; (5) the five-year programs fell into four major curriculum types, but no single pattern of distribution among the areas of general education, subject matter specialization, and professional education emerged.

HASSEL, Milton J. "Analysis and Classification of Follow-Up Practices in Selected Teachers Colleges," Unpublished doctoral dissertation; The University of Nebraska, 1957.

The purpose of the study is to analyze and classify the follow-up activities in selected teachers colleges in the United States. A questionnaire was sent to 282 colleges of education. Of this number 216 responded. Questionnaires were also sent to 401 graduates of the teacher education institution. It was found that (1) visitation is the most frequently used type of activity used in follow-up with the director of placement being in charge of the program; (2) on the general evaluation of the total follow-up services, 30.6 percent of the first year teachers rated them "very valuable", 57.5 percent "some value", and 11.9 percent "little or no value".

INLOW, Gail. "A Comparative Study of Student-Teaching Practices in Thirty-Eight Midwest Institutions", JOURNAL OF EXPERIMENTAL EDUCATION, Volume 28, June 1960, pp. 337-349.

The purpose of this study was to secure information which might be used in evaluating the program of the school of Education of Northwestern University. A questionnaire was sent to 52 teacher-training institutions to get an overview of comparative practices. It was found that 38 institutions had a mean average student teaching enrollment of 113 elementary and 195 secondary students per year. The predominant organizational pattern for both elementary and secondary education was a half day program of student teaching. Thirty institutions made payments directly to teachers or to cooperating school systems. The mean average payment to teachers was $6.06 per quarter hour of student teaching. Cooperating teachers were shown to be selected in various ways, with no one way superior to another. Student teachers were screened on the basis of academic records, a physical examination, a speech test, and an interview.

JONES, Rodney M. "Off-Campus Student-Teaching Programs - Their Size and Importance," JOURNAL OF TEACHER EDUCATION, Volume 11, December 1960, pp. 512-519.

This was a study to determine the status of off-campus student-teaching programs in the United States. A questionnaire was mailed to 1,214 teacher-preparation institutions throughout the United States. Of the 630 questionnaires returned, 551 were used in this study. These institutions represented 49,297 off-campus student teachers. It was found that public teacher-preparation institutions averaged slightly larger numbers of off-campus student teachers, cooperating schools, and cooperating teachers than either private or church-related institutions. For all institutions combined, approximately four student teachers are assigned per cooperating school and slightly more than one per cooperating teacher. On an average, the full-time college supervisors are responsible for 18 student teachers and part-time supervisors for 15 off-campus student teachers. The length of the off-campus student teaching experience averaged about 10 weeks for private institutions and about 12 weeks for both public and church-related institutions.

LAWSON, James Dean. "A Survey of the Professional Practicum Course of the State Colleges of the Commonwealth of Pennsylvania," Unpublished doctoral dissertation, University of Pittsburgh, 1961.

It was the purpose of this research to identify and study the content and practices of the Professional Practicum, a two credit course associated with student teaching. A questionnaire was sent to students participating in student teaching programs in Pennsylvania. Of 2,409 students, 52.4 percent responded. Instructors of the practicum returned 61.0 percent of the questionnaires. It was found: (1) that there was close agreement between teacher and practicum instructors on what was experienced and what was recommended; (2) that all experiences listed under general and specific content were recommended for inclusion as either fairly desirable or extremely valuable; (3) content was more strongly desired than ever was experienced; (4) practices in organization and administration indicated a combined respondent opinion favoring a location at the place of teaching for the student teaching seminar.

LIEN, Arnold J. "A College Evaluates Its Professional Education Program," JOURNAL OF EDUCATIONAL RESEARCH, Volume 57, October 1963, pp. 107-108.

The purpose of this two-year institutional self-study was to determine the basic essentials of a high-quality professional education program, to evaluate the existing institutional program in relation to these essentials, and to recommend a program to meet the needs of the future. Seven committees of teacher education faculty members each met regularly to analyze the program. They utilized their own methods of research including studying current literature, surveying area teachers and administrators, surveying the thinking of the total college staff, correspondence with educational leaders, etc. The findings were: (1) there should be a basic philosophy and set of goals to guide the professional education program; (2) professional education should include psychological foundations, social foundations, methods and student teaching; (3) classroom experiences should be defined for each course to prevent duplication and to insure essential coverage; (4) that a laboratory-experience program should parallel all professional courses; (5) that questionable enrollees should be screened; (6) that an educational materials center be established; (7) that critical thinking, logic, and problem solving be stressed in all classes; (8) that general techniques be eliminated and special methods courses be increased; and (9) that a seminar concurrent with student teaching be required.

MACVEAN, Donald S. "Report of an Evaluation of Curriculum Laboratory Services in a Teachers College," JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, May 1960, pp. 341-344.

The purposes of this study were: (1) to determine which individuals or groups within the library's total patronage use the curriculum library; (2) to learn which materials are used and for what purposes they are used; (3) to determine if the students and faculty receive the materials and services from the curriculum laboratory which they need to carry out their work; and (4) to determine the contribution of the facility to the primary objective of the college--the training of teachers. The data reported were derived from: (1) the statistical record of attendance and use during a typical two-week period, and (2) questionnaires completed by 23 faculty members and 22 students selected at random. Data were organized in raw figures and excerpts of comments. The conclusions of the study include: (1) primary faculty use was by Education professors who teach curriculum courses and supervise student teachers, and faculty members in the academic departments who teach methods courses; (2) the students using the curriculum laboratory were those enrolled in the courses taught by the above-mentioned instructors; (3) most of the materials in the collection were used at some time during the two-week period; (4) reference questions suggest that laboratory staff need training in both library science and curriculum work; (5) the range of materials in the collection should be broadened.

MILLER, Lebern N. "Elementary School Student Teaching in City Colleges," JOURNAL OF EDUCATIONAL RESEARCH, Volume 52, May 1959, pp. 331-335.

A survey of those who work with student teachers in metropolitan colleges was made to ascertain: (1) the workability and desirability of the professional semester or long block type of student teaching program; (2) appropriate related professional courses to compose such a block; and (3) the distributions of time to be allotted within the block. The data consisted of the replies received from 29 college elementary student teaching directors to a 22-item questionnaire. No statistical treatment was applied. The findings included the following: (1) 48 percent of the institutions reported long block of time student teaching programs in operation; (2) modal practice indicated one full semester of student teaching with at least some full-day teaching experiences included; (3) in only six schools were students giving less than 175 clock hours to student teaching; and (4) 60 percent of the colleges provided monetary payment for classroom supervisors of student teachers.

MILLER, Lebern N. "Evaluating Teaching Personality Before Student Teaching Begins," PEABODY JOURNAL OF EDUCATION, Volume 41, July 1963, pp. 49-54.

This study was an effort to determine what is being done to identify and redirect education students whose personalities limit their chances for success on the job. Out of 44 colleges mailed questionnaires, 30 of them responded. It was found that: (1) 25 of the 30 colleges have personality evaluation programs; (2) at 16 of the 25 colleges, the evaluation was described as a formal and written policy; (3) there was considerable uniformity as to the person evaluating and identifying possible cases. That person who held this function was the instructor of the professional experience course.

NELSON, Horace. "A Survey of Student Teaching Practices in Eight Southeastern States," THE JOURNAL OF TEACHER EDUCATION, Volume 14, June 1963, pp. 188-193.

The purpose of this study was to determine existing patterns of student-teaching programs in Alabama and other states in the same geographical area. A questionnaire was sent to all four- and five-year teacher preparatory institutions in the states of Alabama, Georgia, Florida, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee (185 institutions). One hundred and fourteen schools responded to the questionnaire. It was found that six semester hours was the most common number of hours of credit awarded for student teaching. The median number of student teachers accommodated by an institution was 23, with a range from none to 260. Student teachers at these institutions live primarily on the college campus and commute to nearby schools. The range of hours spent in the student teaching experience was from 15 to 240. When asked if representatives of the institutions would make any changes, 78 percent indicated "No". The remaining respondents who wanted a change listed full-time student teaching as their preference.

SMITH, Emmitt. "Administrative Relationships Between Teacher Education Institutions and Cooperating Public Schools," Association for Student Teaching Yearbook, 1961, pp. 3-21.

The purpose of this study was to conduct a comprehensive survey of 75 teacher preparation institutions. The major objective was to determine what relationship exists between these institutions and the public schools. As a result of this questionnaire, it was found that approximately half of the programs studied reported definite movement toward the cooperative assumption of responsibility for teacher education by both the teacher education institution and the cooperatint public school. This movement was evidenced by (1) demonstrated attempts to build good strong human relations between personnel in the college and public schools; (2) a growing willingness to work together in an orderly fashion; and (3) the cooperative building of guide materials which establish mutually accepted procedures.

COLLEGE FACULTY AND STAFF PERSONNEL

ALPREN, Morton. "A Survey of Courses and Programs for the Preparation of College Teachers," JOURNAL OF TEACHER EDUCATION, Volume B, September 1962, pp. 273-278.

The purpose of the study was to determine what institutions are doing to prepare college teachers. A questionnaire was sent to all institutions which were granting the doctorate in 1960. Of the 92 colleges and universities contacted, 69 (or 75 percent) responded. The data revealed that 55 percent of students taking any course in college teaching were in the education department. One-third of the institutions restrict their college teaching courses to doctoral candidates. More than half of the courses are offered yearly. Most classes enroll approximately 15 students and half of the courses require no basic single text.

CAMPBELL, Vaughn M. "A Comparative Study of Certain Socio-Economic and Professional Factors Regarding Faculty Members in Liberal Arts and State Teachers Colleges in Pennsylvania," Unpublished doctoral dissertation, University of Pittsburgh, 1961.

The purpose of this study was to survey and compare certain socio-economic, professional and occupational factors regarding teachers in the liberal arts and teachers colleges of Pennsylvania. It was found that teachers at both kinds of institutions compared closely in mean age, and the number of females and males employed. Teachers College personnel earned higher salaries on the average than did liberal arts college personnel. The study of factors concerning occupational experience showed that liberal arts college personnel had the most varied college teaching experience while teachers college faculty members had the more varied non-college teaching experience. Teachers college personnel also taught more classes per week, more hours per week, and had a higher median class enrollment than had those from liberal arts colleges.

COWAN, Persis Hamilton. "Teacher Role Perception in Colleges and Universities," Unpublished doctoral dissertation, Stanford University, 1956.

This is a study of teachers' roles as perceived by academic and education faculty in ten colleges and universities preparing teachers in the San Francisco Bay Area. Interviews and questionnaires were used, supplemented by related institutional material. Faculty from the following areas participated: Psychological Foundations; Sociological Foundations; three academic departments representing courses required for teaching credentials; Elementary, Secondary methods; Elementary and Secondary student teaching. The data derived were from two questionnaires constructed from behavioral items under each teaching role in Fishburn's Measure of a Good Teacher. Two techniques of analysis were the correlated means formula, and the Nelson schema. It was found that academic professional staff considered the role of the counselor or guidance worker as most important. A great deal of similarity was found between academic and education staffs in teacher role perception. It was concluded that public school experience was not an important factor in role perception.

DRAYER, Adam M. "Students' Views of the Qualifications of Their Teachers," JOURNAL OF TEACHER EDUCATION, Volume 12, September 1961, pp. 338-341.

This study was designed to determine the feelings of students about college instruction in education courses. All 148 students enrolled in "Introduction to Education" (offered in a four-year liberal arts college program for men) responded to a questionnaire. The questionnaire contained evaluative statements about the course. It was found that the college students valued effective methods and techniques far more than any other single qualification possessed by their education college instructors. Students gave second place to knowledge of subject matter, but this item was mentioned only twice as frequently as ability to teach. In this sampling, students placed greatest emphasis on teaching methods, knowledge of subject matter, attention to individual differences, ability to evaluate progress, and ability to motivate.

ECKERT, Ruth E. "Faculty Views on the Recruitment of College Teachers," JOURNAL OF HIGHER EDUCATION, May 1960, Volume 31, pp. 244-251.

A questionnaire and interview survey was made of 706 Minnesota faculty members in 32 colleges concerning views as to the best means of recruiting candidates for academic careers. Comments and questionnaire data point up need for reforms including establishment of basic means for publicizing academic careers, improvement of working conditions on campuses (lighter work loads, more time for research, etc.), more adequate system of recognition and rewards for service--higher salaries. Faculty members urge a wide search for qualified persons, starting earlier (on the high school and undergraduate levels), better counseling and preparation for potential candidates, broader programs of scholarship aid.

EMERICH, Paul Henry. "The Background, Experience, Present Status, and Self-Appraisal of the College Teacher of Education in Michigan," Unpublished doctoral dissertation, University of Michigan, 1957.

The purpose of this study was to determine the background, educational preparation, previous educational experience, status, and present position of college teachers of education in Michigan as compared nearby states. The questionnaire used in this study was developed by the Executive Committee of the National Society of Colleges of Teacher Education. Six hundred sixty-eight faculty members in the states of Michigan, Ohio, Wyoming, and Minnesota participated in the study. It was found that two-thirds of the college teachers of education held doctorates; the median interval of time devoted to counseling was between 10 to 20 percent; the most frequent dissatisfaction expressed was overly long hours; the median salary for college teachers of education fell within a class interval of $7,000 to $7,999; and more than 50 percent of college of education faculty members were between 35 and 49 years of age. In all of the areas listed above, there was a close comparison between Michigan college of education faculty members and college of education faculty members in nearby states.

GUAAL, Van Earl. "An Appraisal of the Doctoral-Student Instructorship Program in the College of Education at Wayne State University," Unpublished doctoral dissertation, Wayne State University, 1959.

The purpose of this study was to appraise the student-instruction program at Wayne and at other universities where the practice exists. An examination was made of the backgrounds of student-instructors (N=40) at Wayne. A questionnaire was also sent to 82 institutions. The questionnaire indicated that instructors are employed by half the institutions surveyed; the masters' degree is a prerequisite for the position; and a definitive salary pattern is set.

MADORE, Normand William. "Status of the Director of Student Teaching in Member Institutions of the American Association of Colleges for Teacher Education," Unpublished doctoral dissertation, Wayne State University, 1962.

The purpose of this study was to determine the status of directors of student teaching through the reporting and analysis of existing practices. The population studied consisted of the entire membership of the American Association of Colleges for Teacher Education (AACTE). Data were secured through a mailed questionnaire with planned follow-ups. Three hundred ninety-eight usable instruments representing 81.7 percent of the total mailed were received. It was found that: (1) over 69 percent of the respondents hold the doctorate degree; (2) membership in the National Education Association and the Association of Student Teaching was reported by over 70 percent of the respondents;

(3) one out of every two respondents sought the directorship as his professional objective; (4) eighty-three percent of the respondents reported no previous experience as director of student teaching.

MCGRATH, Earl J. "The Preparation of College Teachers: Some Basic Considerations," JOURNAL OF TEACHER EDUCATION, Volume 13, September 1962, pp. 247-252.

The purpose of this stydy was to determine how college presidents feel about the training of faculty members. A questionnaire was sent to 544 college presidents; a total of 503 replied. It was found that 60 percent of the college presidents expressed dissatisfaction with the training of the Ph.D's they engaged as instructors. Another 13.9 percent made suggestions for changes in the graduate program pursued by future college teachers. College presidents felt that education of college teachers was too specialized (60 percent). More than half (55.5 percent) of the respondents considered beginning college teachers to be unskilled in professional activities of the classroom. The author suggested an apprenticeship in teaching for the future college teacher.

VELDMAN, Donald J., PECK, Robert F. and MCGUIRE, Carson. "Measuring the Value Systems of Education Professors", JOURNAL OF EDUCATIONAL PSYCHOLOGY, Volume 52, December 1961, pp. 330-334.

The purpose of this study was to determine what similarity exists between education professors' ratings of the same persons. Four educational psychologists rated 53 sophomore coeds on 50 personality variables and on "overall mental health". The ratings were based on qualitative analysis of a battery of data regarding the sophomore students including a biographical form, the Peck Sentence Completion (2-D), group TAT, Bowers School Situations Analyzer, and an Educational Issues Questionnaire. The average interjudge rating was 0.85. Some significant differences were found in the construct systems of the four judges. Each showed certain unique concepts about the structure of personality. Each differed at certain points about the personality correlates of mental health, although there was agreement among all the judges that 12 personality variables are closely related to mental health.

CURRICULUM OFFERINGS IN TEACHER EDUCATION

ACKERMAN, Ralph E. "A Critical Analysis of Programs for Junior High School Teachers in Teacher Education Institutions of the United States," NASSP BULLETIN, Volume 46, February 1962, pp. 393-394.

The purpose of this study was to make a critical analysis of the curricula for the preparation of junior high school teachers in institutions accredited by NCATE. From the literature the author selected tentative statements of areas of preparation for junior high school students. This list was sent to eighty-five selected junior high school administrators, ninety-one college professors of education and thirty-three state certification officers. Evaluation statements from these respondents served to develop the final statement of areas of preparation. Inspection of college catalogs and correspondence with 246 schools approved by NCATE yielded 36 institutions which had special curricula for junior high school teaching. The 36 institutions were divided into two groups--24 with four-year programs and eight with fifth-year programs. It was found that: (1) most of the institutions require that 70 percent of the junior high curriculum be taken in general education or in subject matter preparation; (2) most of the special junior high school curricula are modifications of the curricula for elementary or general secondary teachers; (3) there is general agreement of educators in the areas of preparation for junior high school teaching.

ACKERMAN, Ralph E. "The Preparation of Junior High School Teachers", JOURNAL OF TEACHER EDUCATION, Volume 13, March 1962, pp. 69-71.

This study was undertaken to determine present practices in the preparation of junior high school teachers. The programs of 246 institutions accredited by NCATE were used for the study. A study of catalogs was the method by which the information was obtained. It was found that: (1) teacher education institutions as a group do not give direct attention to the preparation of junior high school teachers; (2) the few institutions which offer training for junior high school teachers do not have separate departments for doing this. It was concluded that the curricula for training junior high teachers should be designed to facilitate the teaching of that age range.

ADKINS, Arthur. "A Program for the Preparation of Core Teachers Based Upon a Survey of Teachers in The Core Curriculum," Unpublished doctoral dissertation, University of Minnesota, 1958.

The purpose of this study was to determine what recommendations for a program of preparing core teachers can be made on the basis of information supplied by core teachers. Seven hundred sixty core teachers responded to a checklist of 108 core characteristics which represented an expansion of Alberty's ten criteria of the core. One hundred forty-four of these teachers completed a second questionnaire in the form of a check list based upon the suggested program for preparing core teachers in a publication of the Association for Supervision and Curriculum Development, PREPARATION OF CORE TEACHERS FOR OUR SCHOOLS. In general, the findings of the study indicate that, in the judgments of the core teachers, a core teacher preparation program should possess features characteristic of a core program itself.

BEARD, Jess R. "Student Teaching for Experienced Teachers," JOURNAL OF TEACHER EDUCATION, 1959, Volume 10, pp. 475-478.

The purpose of this study was to present an analysis of questionnaire responses regarding required student teaching and other professional laboratory experiences for experienced elementary school teachers. Forty-three experts representing 29 institutions gave their opinions on (1) requiring student teaching for experienced teachers, (2) substituting teaching experience in lieu of student teaching, and (3) adapting student teaching to the needs of experienced teachers. It was found that experts do not believe that traditional student teaching programs designed for the inexperienced teacher-trainee meet the needs of experienced teachers. They suggest that greater emphasis be given to programs adapted to the teacher's background and experience.

BRADLEY, Gladyce H. "A Survey of Field Experiences in Institutions in A.A.C.T.E." JOURNAL OF EDUCATIONAL RESEARCH, Volume 52, May 1959, pp. 343-347.

The purpose of this investigation was to determine the motive, purposes, structure, procedures, and problems of the student field experiences in American Association of Colleges for Teacher Education institutions. A seventeen-item questionnaire was mailed to the 356 member institutions. This report summarizes in non-statistical fashions the responses of the 162 respondents. It was found that Field Experience was defined as "non-school experiences of students in the community." Slightly more than 26 percent of the institutions stated that they have no such program. The purposes of field experience programs could be subsumed under the following four objectives: (1) to acquaint students with the programs of the several community agencies which cooperate with the school to provide educational experience, (2) to provide pre-student teaching experiences with youth, (3) to increase the student's understanding of child development, and (4) to provide experiences in group work and group dynamics. Other findings included the following: (1) field experience is provided as a separate course in only 33.9 percent of the institutions; (2) field experience is offered in conjunction with a variety of different courses; (3) 61.4 percent of the institutions require field experience of all teacher education students; (4) there is little agreement concerning the relationship of field experience to college credit; (5) the number of clock hours of participation in a community agency varied from no requirement to 300 hours with a median requirement of 44 hours; (6) questions relating to student, agency, and college responsibilities in field experience programs indicate a diversity of practice and a variety of outcome.

COOPER, James G. and ELSBREE, Harold M. "A Comparison of Two Plans of Teacher Education," JOURNAL OF EDUCATIONAL RESEARCH, Volume 51, May 1958, pp. 643-657.

This study sought to ascertain the relative effectiveness of an elementary school teacher preparation program involving 36 hours of professional education distributed over the entire four years of college (Plan I) with a program involving the same courses placed only in the junior and senior years (Plan II). The specific questions for which data were gathered were: (1) were the graduates from the two plans equivalent with regard to academic aptitude, reading ability, and academic achievement? (2) did one plan produce a higher proportion of drop outs? (3) were the graduates of the two plans equally successful in their first teaching experience as measured by their own and employers' opinions? (4) did the graduates of the two plans hold similar opinions concerning the adequacy of their curriculums, their preference for a plan, and their attitudes toward teaching? Evidence pertaining to these questions was obtained from 118 students one year after their graduation from official college records and by means of questionnaires constructed for this study. A chi-square test failed to reveal significant differences between the groups on ACE scales, Iowa Silent Reading Test data, or grade point average. Likewise, the proportion of drop outs, both overall and by semester, was comparable for the two groups. Employers' opinions favored Plan I graduates in the following areas: human relations, personal characteristics, classroom planning, teaching elementary school subjects (significant at 0.01 level), and teaching techniques (significant at 0.05 level). The graduates' opinions favored Plan II graduates in the following areas: preference for Plan II (significant at 0.01 level), teaching elementary school subjects (significant at 0.01 level), and teaching techniques. The authors conclude, "This evidence fails to support the current rash of teacher education programs which concentrate the professional sequence into a final year or final two years of study."

DUGAN, James R. and HINELY, Reginald T. "What Does A Course in Curriculum Theory Accomplish?" JOURNAL OF EDUCATIONAL RESEARCH, Volume 57, October 1963, pp. 80-83.

This research report begins with a detailed description of the content and procedures of a graduate course in general curriculum enrolling teachers from all grade levels and subject fields. The research, which was an evaluation of the course, sought to answer the following questions: (1) did the students gain in their knowledge of curriculum-related subject matter? (2) did the students gain in an understanding of how curriculum change occurs and how they could most effectively serve as agents in bringing about this change? (3) did the students gain in their ability to communicate these beliefs about curriculum matters and to apply these beliefs with a minimum of inconsistency to specific school activities? Three instruments were used to collect data, the Curriculum Improvement Measure, the Curriculum Test, and a series of four student papers dealing with foundations of curriculum. The two tests were administered prior to and following course instruction. The papers were read independently by two staff members to determine growth in the ability to articulate curriculum beliefs. A number of possible relationships among the measurement devices were investigated by means of computing correlations among the three measures. The authors conclude the following from the data collected: (1) team teaching utilizing advance graduate students as staff members can be effective; (2) even a class of 79 can function reasonably well as a discussion group; (3) a course such as this can lead to a marked improvement in readiness for curriculum change, knowledge of curriculum subject matter, and the ability to articulate beliefs about curriculum.

EASON, Elmer. "Semantics and Logic for Education Students," JOURNAL OF TEACHER EDUCATION, Volume 11, December 1963, pp. 524-527.

This was a study designed to secure information about the amount of preparation given professional education students in semantics and logic. A questionnaire and other material were sent to a sampling of teacher education institutions in the United States and its territories. Of the 194 institutions included in Sample One, 111 (57 percent) returned the forms. Of the 81 institutions included in Sample Two, 51 (63 percent) returned the forms. Approximately 38 percent of the study group require preparation in semantics or logic or both for all education students at the bachelors level. Approximately 27 percent of institutions require preparation in logic or semantics at the M.A. level. It was concluded that teachers are not receiving instruction in semantics and logic to any great degree.

FLANDRO, Royce P. "Curriculum Laboratories in Colleges of Teacher Education," Unpublished doctoral dissertation, Indiana University, 1957.

The purpose of this study was to discover the status of curriculum laboratories in colleges of teacher education in the United States with special emphasis upon curriculum development. A working definition of curriculum laboratories was developed and sent in a postal card questionnaire to deans in 396 colleges of teacher education in the United States asking them whether or not they had a curriculum laboratory. A second questionnaire was developed and mailed to the curriculum directors. One hundred questionnaires were returned out of 140 mailed. It was found that 58 percent of the laboratories conduct curriculum study and revision in addition to providing curriculum materials.

GAST, David K. and BARNES, John B. "A Survey of Facts and Attitudes Concerning Junior College Offerings in Education in Eighty-three Western Junior Colleges, January 1962." JOURNAL OF TEACHER EDUCATION, Volume 14, December 1963, pp. 391-398.

It was the purpose of this study to determine the extent of course offerings in professional education by eighty-three Western Junior Colleges and to discover the opinions of chief administrators of these junior colleges with regard to such offerings. A questionnaire was sent to 83 administrators of junior colleges in the eleven-most western states. Of the 83, a total of 73 questionnaires were returned which comprised a response of 88 percent. It was found that Idaho and Colorado led the eleven states with the highest average number of course offerings for teacher training (7.7 and 7.2 courses). Student teaching was listed in one institution in each of these two states. The majority of the administrators felt that: (1) education should be offered in junior colleges; (2) education courses should not be restricted to the sophomore year; and (3) pre-professional courses should be offered in any field.

GROFF, Patrick J. "Self-Estimates of Teaching Ability in Elementary School Subjects," THE JOURNAL OF TEACHER EDUCATION, Volume 13, December 1963.

This study represented the points of view of a selected group of student teachers with regard to their general relative strengths and weaknesses in teaching elementary school subjects. The subjects were 645 student teachers from six different California colleges located from the northern to the southern part of the state. These 645 student teachers put into rank order eleven elementary school subjects: arithmetic, art, handwriting, music, oral language, physical education, reading, science, social studies, spelling and written composition. In ascending order, they listed the subjects which they liked to teach from 1 to 10. The five subjects most liked by the student teachers were: reading, arithmetic, spelling, social studies, and science. Reading was given the highest rank by 63.9 percent of the students. The subjects in which students felt most inadequate were: handwriting, written composition, music, oral language, physical education, and art. The investigator concluded that adequacy in teaching elementary school subjects has a direct relationship to the number of college level courses taken related to that subject.

HALLAND, Marjorie Lee. "A Study of the Relationship Between The Preparation of Teachers of English and The Achievement of Their Students," Unpublished doctoral dissertation, University of Arkansas, 1963.

The purpose of this study was to determine the relationship between the preparation in English of secondary teachers of English and the achievement of their students as freshmen. The subjects were 218 students who entered the University of Arkansas as first semester freshmen in the fall of 1961. The students' raw scores and percentile ranks on the Mechanics of Expression Test of the Cooperative English Test were plotted on a scatter-diagram. Then these teachers' total college hours in English were secured from transcripts on file with the state department of education. Analysis of the data showed that no relationship existed between students' achievement scores and their teachers' number of college hours in advanced grammar or advanced composition, or total number of hours in English. Teachers of grades 10 to 12 had more hours in English than did teachers of 7 to 9. It was concluded that the number of semester hours as a measure of teaching competence may not be so important as it is often thought to be.

HARAP, Henry and MC KIE, Laura Lou. "Education Courses Taught in Fifth-Year Programs of Classroom Teacher Education in 1959-60" TEACHER EDUCATION SERIES, Washington: U. S. Printing Office, 1962.

This paper is confined to a study of education courses as reported in the comprehensive questionnaire used in the survey of fifth-year programs of classroom teacher education. The director of each program was requested to list course titles taken by a typical student. Programs in 462 institutions offering fifth-year programs were surveyed. These institutions constituted 98 percent of all institutions which conduct fifth-year programs of teacher education. It was found: (1) the most widely taught subject in curriculum and teaching was special methods in teaching; (2) educational psychology appeared more than twice as frequently than did other courses in the broad field of foundations of education; (3) the six most popular courses offered were foundations of education, curriculum and teaching,specialized teaching fields, educational research and statistics, general fields of education, and special education.

LIGGITT, William. "An Evaluation of General Education in Elementary Teacher Preparation," THE JOURNAL OF EDUCATIONAL RESEARCH, Volume 57, November 1963, pp. 156-159.

The purpose of the study was to evaluate the general education achievement in social studies, science, and mathematics of the elementary education majors at Jersey City State College over their first four college semesters. Two instruments were used for this study. They were: the SCAT (Form 1A) and the STEP (Level 1 Form 1A and Level 1 Form 1B). The instruments were administered to 64 students enrolled in the elementary education curriculum at Jersey City State College. Grade point averages for 12 semester hours in social science and science and 6 semester hours in mathematics were computed and used as a measure of actual achievement in general education. A comparison was then made of the test scores and grade averages. It was found that the group's mean capacity to achieve (SCAT mean--298) more nearly approximated their mean achievement in social studies than in science or mathematics. Low correlations were found between grade point averages and both instruments.

MAYNARD, H. Glenn, "A Study of the Professional Preparation of Junior High School Teachers," NASSP BULLETIN, Volume 46, February 1962, pp. 395-396.

The purpose of this study was to describe a pre-service program of preparation for junior high school teachers which would be acceptable to junior high school administrators. Requirements and course descriptions were obtained from twelve institutions with preparation programs for junior high school teachers. From these descriptions a questionnaire was devised and mailed to 143 junior high school principals. One hundred and twenty-eight, or 86.71 percent were returned. It was found: (1) that general agreement existed among principals on the benefit of courses (junior high school methods received the highest number of positive responses); (2) there was general agreement between administrators and writers in the field as to what constitutes an acceptable junior high school curriculum.

NAGLE, L. Marshall. "Some Effects of Student Teaching Patterns Upon Professional Attitudes," JOURNAL OF EDUCATIONAL RESEARCH, Volume 52, May 1959, pp. 355-357.

This research was designed to test the following null hypotheses: (1) results of measures of selected aspects of professional attitudes remain substantially unchanged during a semester in which student teaching occurs, and (2) results of measures of selected aspects of professional attitudes remain substantially equivalent through a semester, whether a part-time or full-time student teaching experience occurs. To obtain data, the Professional Attitudes Measure was administered at the beginning and conclusion of the semester of student teaching to 136 undergraduate students, divided approximately equally between full- and part-time student teaching assignments. The data obtained were analyzed through the establishment of group means and standard deviation of means. The results indicated that both null hypotheses should be rejected. The positive change of the part-time student teaching group was significant at the 0.05 level for attitudes toward pupils. The positive change of those having full-time student teaching was significant at the 0.01 level for attitudes toward pupils and teaching, and significant at the 0.01 level for attitudes toward teachers and school-community relationships. Further analysis revealed that the two groups entered the semester with approximately the same professional attitudes, and possessed the same characteristics with regard to professional education courses, academic achievement, and psychological test scores. The author concludes that "a semester providing an integrated program of teaching methods and materials with student teaching was significantly better than the typical semester providing 1 - 2 hours a day of student teaching."

NEA, Research Division. "Teacher Opinion Poll on Teacher Preparation" NEA JOURNAL, Volume 52, December 1963, p. 34.

This study solicited practicing teachers' opinions concerning whether their undergraduate teacher preparation programs had prepared them for their actual teaching needs. Ninety-seven percent of a "scientifically" selected sample of the nation's 1.5 million teachers responded to an opinionnaire. They were asked to rate their preparation in: (1) subject knowledge; (2) general education; (3) psychology of learning; (4) human development; (5) teaching methods; (6) history and philosophy of education; and (7) use of audio-visuals as being (a) too little, (b) about right, or (c) too much. The data revealed that 27 percent of the teachers felt that they had received too little preparation in teaching methods. Sixty percent registered a need for more preparation in audio-visual equipment and materials. Seventy-eight percent of secondary teachers and 70 percent of elementary teachers found the emphasis on specialized subject matter about right or too much. The area in which the highest percentage of teachers believed they had received too much preparation was in history and philosophy of education.

OGILVIE, William K. "An Analysis of the Organizational Patterns, Purposes, and Content of the Introductory Course in The Pre-Service Professional Education of Teachers," Unpublished doctoral dissertation, Indiana University, 1956.

The study was concerned with the problem of determining the organizational patterns, purposes, content and trends of the introductory course in the pre-service education of teachers. A preliminary questionnaire survey was made of the 280 colleges and universities accredited by the American Association of Colleges for Teacher Education to determine those with an introductory course in the initial phase of the education curriculum. One hundred and fifty-eight institutions were selected from this list to be sent a questionnaire and 137, or 86.7 percent returned these questionnaires. It was found that (1) the prevailing practice in the majority of teacher education institutions is to use an introductory-orienting course in education; (2) introductory course instructors have found professional guidance as a legitimate part of the course; (3) the selection function is effectively practiced in a small minority of introductory courses.

SCHERWITZKY, Marjorie. "Attitudes of Students Toward Education Courses at State University College at Oneonta, New York," Unpublished doctoral dissertation, Columbia University, 1963.

The purpose of this study was to construct an instrument which could be used to compare students' attitudes, as revealed through their responses, with what the critics have written about education courses. An analysis was made of the criticisms of education courses as found in the literature for the period 1949-1959, and an attitude scale was developed using the Likert method. The scale was administered to 200 students on a trial basis. A revised scale of 90 items was then administered to 1,337 students attending State University College at Oneonta, New York. Scale scores were analyzed in relationship to six variables--sex, college class, curriculum major, father's occupations, grade point average, and plans for teaching. An item analysis was also conducted by college class. It was revealed that 63 percent of the 90 items elicited favorable responses from students in all classes. Students in the freshman, sophomore, and junior classes responded favorably to 86 percent of the items. Senior replies were unfavorable to 37 percent of the items. Unfavorable reactions centered around items concerned with repetition, theoretical approach, development of teacher-pupil relations, and the poor student "getting by" in education courses. It was concluded that: (1) student replies, as a whole, refuted critics' opinions that knowledge of subjects to be taught is adequate preparation for teaching; (2) there is too much emphasis on "methods" courses; (3) education courses are easy and a waste of time, and course content is of little value.

SMITH, Herbert F. A. and **DOWE**, William H. "Duplication of Course Content: A Comparative Study" JOURNAL OF TEACHER EDUCATION, Volume 11, September 1960, pp. 345-348.

A survey of student teachers' attitudes on duplication of course content in professional education was conducted at Southern Illinois University in 1959. A similar study was conducted at another institution located in the Middle West (College A). College A had the same number of student teachers as Southern Illinois (SIU). From data derived from the questionnaires, it was found that 78 percent of the SIU students and 50 percent of College A's students felt that there was more repetition in professional education courses than in non-professional courses.

TWYMAN, J. Paschal. "Elementary Education Student Teaching and Orientation to Science and Mathematics" THE JOURNAL OF TEACHER EDUCATION, Volume 13, 1963, pp. 133-134.

The purpose of the investigation was to determine whether the student teaching experience in the public schools during the junior year could be effectively used to help students discover their needs for strenghthening certain academic areas in science and mathematics. Sixteen elementary education majors at the junior level (the experimental group) were selected to do their student teaching during the second semester of the 1959-1960 school year, and a comparable group of sixteen students at the senior-year level (the control group) did their student teaching exactly one year later. An attempt was made to determine whether the experimental and control group would differ significantly with respect to the number of advanced college hours taken in science and mathematics during the last two college years. Pre- and post-tests of aptitude and attitude were administered to both groups. For the measurement of aptitude and attitude in science and mathematics, the Sequential Tests of Educational Progress (STEP), Science and Mathematics Form 1-A and 1-B were used. Attitudes toward science and mathematics were measured with an instrument developed by the investigating team. An analysis of completed official transcripts was made. By using Fisher's Exact Probability Test, it was found that there was no significant difference between experimental and control groups in the number of semester hours of course work taken in science and mathematics during the final two college years. It was also found that significant differences did not exist between experimental and control groups in degree of positive attitude toward science and mathematics. An analysis of covariance showed no significant differences in understanding between groups, either for science or mathematics.

WATTLES, Marshall D. and OSIBOV, Henry. "The Content of Teacher Education" JOURNAL OF TEACHER EDUCATION, Volume 11, December 1960, pp. 464-469.

The purpose of this was to investigate the extent that professional education courses dominate the curriculum of students preparing to teach in secondary schools. Transcripts of 108 University of Oregon graduates of 1958 were examined. The sample included only those graduates who enrolled in college for the first time after September, 1953. The term hours earned in each of the major divisions of the College of Liberal Arts and in each professional school were recorded, and the percentages of each program to fall within each of the categories were calculated. It was found that only those who majored in education (less than one teacher in five) averaged as much as 20 percent of their work in education courses. For the others, the time spent in education courses ranged from 10 to 15 percent of the entire four years. It was concluded that although there is not an undue amount of professional education courses in the programs of the subjects studied, students avoided such courses as science and foreign language.

INSTRUCTION AND FIELD EXPERIENCE IN TEACHER EDUCATION

AARON, I. E. "What Teachers and Prospective Teachers Know About Phonics Generalizations" JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, May 1960, pp. 323-330.

The purposes of this study were: (1) to assess teacher and prospective teacher knowledge of second and third grade difficulty-level phonics generalizations at the beginning of a course in the teaching of reading; (2) to determine the relationship between knowledge of phonics generalizations and amount of teaching experience; and (3) to determine the relationship between knowledge of phonics principles and educational assignment for experienced teachers or assignment preference for prospective teachers. A test of phonics principles was devised around 8 principles of phonics that ordinarily are taught to children who are working with basal readers on second and third grade difficulty levels. The test consisted of 60 multiple-choice five-option items including nonsense words so that respondents must rely upon principles rather than mere recognition. By means of the Hoyt Analysis of Variance Method of Test Reliability, a coefficient of 0.98 was obtained. The test was administered to 104 experienced teachers and 189 teachers-in-preparation. The Welch-Noyer test was used to test the homogeneity of variances, and an analysis of variance was made between the experience and grade groups. The findings were as follows: (1) The mean score of correct items was 34.22 of a possible 60, and scores ranged from 13 to 59 items correct. The author concludes that courses in the teaching of reading should give attention to phonics principles themselves as well as to how to teach these principles; (2) the subjects performed much better on certain of the items than they did on others; (3) years of teaching experience was found to be significantly associated with performance on the phonics principles test; educational assignment or assignment preference was not associated with performance on the test.

ABEL, Frederick Paul. "Use of Closed Circuit Television in Teacher Education: Relationship to Achievement and Subject Matter Understanding," Unpublished doctoral dissertation, University of Minnesota, 1960.

This study was designed to explore the usefulness of closed circuit television as a medium for the observation of classes by students in a beginning professional education course at the University of Minnesota. Six laboratory sections were randomly assigned to three observational treatments. An additional section served as a control. The experimental sections were provided with closed circuit television demonstrations and instructional films. The instruments used to measure the subject matter mastery were the mid-quarter and final examinations designed for the course and a standardized test, Tests of Human Growth and Development. Scores on the Miller Analogies Test showed no significant difference between groups at the pre-test stage. It was found that no significant differences existed between the groups on the achievement measures. It was concluded that although no differences existed, closed circuit television can prove to be an economical means of providing observation experiences to teacher trainees.

ADOLPHSEN, Louis J. "A Comparison of The Effectiveness of Selected Observational Procedures in Developing Teacher Perception," Unpublished doctoral dissertation, University of Minnesota, 1961.

This investigation was designed to compare the effectiveness of classroom observation by closed circuit television, kinescope recordings, and direct observation upon undergraduate students' ability to perceive and to develop skill in perceiving effective teacher behavior in an introductory course in secondary education. The study was conducted at the University of Minnesota, 1960-61. Students were assigned, using a randomized block design to the following groups: (1) two methods of direct observation; (2) observation in both large and small groups by closed circuit television; (3) observations by similarly sized groups of kinescope recordings; (4) two non-observational control groups. The main experimental treatment consisted of six classroom observations viewed by the experimental media during the lecture hour. The control group received lectures based on the general purpose of the classroom observation. The instruments used in the study were: The Miller Analogies Test, Form A, The Minnesota Teacher Attitude Inventory, the Bowers Teacher Opinion Inventory, the Cooperative Reading Test, Form R and course examinations. In addition, the Observational checklist and the Film Test of Teacher Perception were developed as part of the study to guide and assess the perception of teacher behavior and to evaluate the perceptual difference within the subgroups at the conclusion of the investigation. Within the design, the analysis involved the use of unweighted means of sub-sample groups in a three-way analysis of variance. The sum of squares for main effects and interactions were broken into individual degrees of freedom by the method of orthogonal contrasts. It was found that the nature and extent of observational experience, rather than media, was the significant factor in differentiating the perception of teacher behavior.

American Association of Colleges For Teacher Education. SURVEY OF PROGRAMMED INSTRUCTION IN TEACHER EDUCATION. A Report by Subcommittee on Instructional Media and Teacher Education of the Committee on Studies, 1963.

The purpose of this study was to identify individuals and institutions actively engaged in utilization, experimentation and research related to programmed instruction in teacher education. In September 1962, a request for names of college faculty members working with programmed instruction in teacher education was sent to the institutional representatives of the 609 colleges and universities holding membership in the Association. Detailed questionnaires were sent to 612 faculty members and 368 replies were received (60 percent return). Of the total number of replies, 328 were usable. It was found that: (1) 93 of the 328 returns (28.4 percent) indicated that the respondents had taught or were teaching a special course or workshop in programmed instruction; (2) 113 of the 328 returns (34.5 percent) indicated that students were taught how to write programmed material; (3) 94 percent of the respondents had programming class enrollments consisting of from 76 to 100 percent teacher education or in-service students; (4) one-third of all respondents had written programs relevant to teacher education. Nearly one-half of the programs were intended for teacher education students, and were typically concerned with areas of educational methods, measurement and statistics, and psychological foundations; and (5) more than 50 percent of all respondents had conducted or supervised research employing programmed material. It was concluded that there a vigorous interest exists in programmed instruction in teacher education.

AMIDON, Edmund. "The Isolate in Childrens' Groups" JOURNAL OF TEACHER EDUCATION, Volume 12, November 1961, pp. 412-416.

This was an experimental study used in connection with a pre-service education course at Temple University in an effort to prepare teachers to facilitate the isolates integration into the group. The course was designed to help the students understand the elementary classroom group. Each student acted as leader of a small group of 7 to 15 children in a social work agency. The 79 elementary education students were divided randomly into two instructional groups. One group was taught to use those techniques which on the basis of previous research findings seemed to have been successfully used to help the isolate become a member of his group. In the other group the instructor emphasized the diagnostic approach to the classroom and students were asked to analyze the social-psychological factors present in their groups before deciding on a technique to use. Based on the use of sociometric measures, isolates were identified in the pupil groups of 15 students in each of the college classes. In the groups that were taught newer techniques, isolates were reduced from 15 to 9, while the group which used diagnostic procedures had isolates reduced from 15 to 3 (significant at the 0.05 level).

AMIDON, Edmund and BLUMBERG, Arthur. "Student Perceptions of Group Work in Teacher Education Classes," JOURNAL OF EDUCATIONAL RESEARCH, Volume 56, March 1963, pp. 352-357.

This study focused upon four areas: (1) differences between elementary and secondary education students in regard to their perception of effectiveness of different group work methods; (2) the factors seen by these students as having relevance for making a particular method successful or unsuccessful; (3) level of satisfaction with different methods; and (4) the extent to which these students see themselves using group methods once they are in their own classrooms as teachers. Data were collected by a questionnaire administered to undergraduate education students. Using a two-by-two contingency table, a chi-square was computed to find out if there were significant differences among frequencies obtained from the categories of students. The following constitute the major findings: (1) many more elementary students prefer small group methods and, conversely, many more secondary students prefer general class discussions; (2) the characteristics most apt to make a student like or dislike group teaching methods was his perception of (a) opportunity or lack of opportunity to participate verbally, (b) locus of classroom control, (c) amount of security felt, (d) opportunity for sharing ideas; (3) secondary people feel that the lecture, in comparison with group methods, is more effective than do elementary people; (4) elementary students, whether they prefer the small group or the large group situation for themselves, felt they would use group methods more in their own teaching than did the secondary students.

BEMADO, Rose Ann. "Cultural Backgrounds of Students and Cooperating Teachers as Related to Attitudes Toward Children, Problems of Student Teaching, and Achievement of Student Teachers," Unpublished doctoral dissertation, Pennsylvania State University, 1963.

A sixteen-item questionnaire was designed to elicit information concerning the family background, educational training, and activities of the student teachers and cooperating teachers. The Allport-Vernon-Lindzey study of Values Test supplemented information obtained from the Personal Data Questionnaire. The Minnesota Teacher Attitude Inventory was adopted to measure the students' and cooperating teachers' attitudes toward children. A Student Teacher Achievement Scale, by Troisi, was used to rate the achievement of the students. The population consisted of 65 student-cooperating teacher pairs in Pennsylvania. It was found at the 0.01 level of confidence, that a greater number of problems were reported by cooperating teachers when their cultural backgrounds were quite different from their student teachers'. It was concluded that cultural backgrounds should be considered when pairing student teachers with cooperating teachers.

BLANCHARD, B. Everard. "An Approach Toward Evaluating the Seminar" TEACHER EDUCATION QUARTERLY, Volume 12, Fall 1954, pp. 21-24.

The purpose of this study was to indicate how student teachers react to an education seminar. Twenty-one student teachers at the State Teachers Colleges at Keene and Plymouth, New Hampshire, were asked to complete a questionnaire suggesting what they would like to discuss in an education seminar. Guidance, evaluation, education for vocational life were the three items more often mentioned. At the end of the seminar, students were asked to evaluate the topics relative to their importance to them. It was found that the rank order at the conclusion of the seminar was different. The top three items of interest were: the school lunch program, subject matter testing, and education for vocational life. Although the rank order of item importance had changed, the author concluded that the students were generally enthusiastic about the approach.

BOND, Jesse A. "Analysis of Observed Traits of Teachers Rated Superior in Using Speech as a Teaching Instrument," JOURNAL OF EDUCATIONAL RESEARCH, Volume 51, May 1958, pp. 669-677.

The purpose of this study was to ascertain in what ways teachers who were found to be highly competent in using speech effectively were like and unlike other teachers having less ability in this trait. Two groups were compared in this study. One was an unselected group of 855 elementary and secondary student teachers who had received ratings on a five-point scale on 32 traits related to teaching. The second group consisted of the 266 from the 855 who had been rated superior in ability to use speech in teaching. Comparisons were made on the basis of mean scores attained by both groups on each of the 32 traits composing a student teacher rating scale. Mean scores on all 32 characteristics were higher for the speech group than they were for the unselected group. This was the case for both elementary and secondary student teachers. The speech group was rated relatively lower than the unselected group in broad cultural understanding, evaluation skills, and attention to supplies and equipment. The superior speech teachers were significantly high in all qualities pertaining to effectiveness in directing the learning of their pupils. The author concludes that "the findings of this study strongly suggest that teacher education institutions should ascertain the specific behavior and personal qualities involved with teachers who are effective in using oral communications and should devote more attention to them in preparing all teachers."

CAMPBELL, Carl. "An Experimental Investigation of the Value of One Method of Self-Appraisal in Developing Certain Attitudes Among Student Teachers," (Unpublished doctoral dissertation, University of Virginia, 1963).

The purpose of this study was to evaluate one method of self-appraisal and to determine student teachers' reaction to directed and sustained self-appraisal. Two hundred and forty-two students at

Shippenburg State College were divided into one experimental and one control group. Each group was administered the Minnesota Teachers Attitude Inventory. The experimental group engaged in self-appraisal during student teaching; the control group did not. At the end of the student teaching period, the MTAI was again administered. Students in the experimental group were also asked to react to a questionnaire which sought their reaction to self-appraisal. It was found that the MTAI scores of the experimental and control groups did not differ significantly in the pre- and post-test stages. Students of the experimental group felt the process of self-appraisal had some value.

CHABE, Alexander M. "An Experiment With CCTV in Teacher Education" PEABODY JOURNAL OF EDUCATION, Volume 40, July 1962, pp. 24-30.

The problem of this study was concerned with the effectiveness of observation of instruction via closed circuit television (CCTV). Elementary Education students enrolled in a social studies methods course at The State University of New York at Fredonia were the subjects used for this study. The experimental group was composed of 18 persons, with the same number in the control group. One group observed classroom activity by television and the second group observed in the classroom during the telecast. Both groups were asked to record: (1) generalizations they formulated which children could also formulate; (2) the skills children developed; (3) the attitudes children formed; and (4) the pupil appreciations which grew out of the lesson on agriculture and manufacturing in the modern South. It was found from the nature and extent of the generalizations formulated that guided televiewing was almost as effective as actual guided classroom observation.

CORRIGAN, Dean and GRISWOLD, Kenneth. "Attitude Changes of Student Teachers," JOURNAL OF EDUCATIONAL RESEARCH, Volume 57, October 1963, pp. 93-95.

This study was designed to determine the expressed attitude change of student teachers toward three principles of education. These principles were: (1) the learner's purposes are recognized and utilized; (2) the learner engages in problem solving; and (3) the learner is helped to develop generalizations which he can apply in a variety of life situations. The sample consisted of 63 student teachers enrolled in fifth-year pre-service childhood-education programs at metropolitan universities. They completed an 80-statement attitude inventory designed by the authors to measure verbalized attitude changes toward the above three principles. A comparison of each student's response prior to and upon completion of student teaching was considered a measure of his attitude change. In addition, a random sample of 25 subjects were interviewed to ascertain their perceptions of causes of their attitude changes. The results of the study indicate a mean attitude change of plus 09.8 points. This change was statistically significant with a standard deviation of 21.5 and a standard error of the mean of 02.7. There was a range of change of 67 points with scores of plus 40 to minus 27. It was concluded that: (1) high positive change with certain college supervisors and less positive or negative with others; (2) high positive change for students teaching in lower grades and less for those working in upper grades; (3) high positive change with one student teaching placement and less for students with two or more placements; (4) less positive changes in students whose undergraduate major field of study was psychology or sociology than students with majors in other fields.

COX, Dan. "An Objective and Empirical Study of the Factors of Laboratory Experience in a Professional Education Course Prior to Student Teaching," JOURNAL OF EXPERIMENTAL EDUCATION, Volume 29, September 1960, pp. 89-94.

The purpose of this study was to determine attitudinal changes of teaching candidates resulting from laboratory experience in the pre-student teaching course, Human Growth and Development. The sample for this study was drawn from juniors and seniors at a Southwestern state teachers college (N=122) who were enrolled in Human Growth and Development. The Minnesota Teacher Attitude Test (MTAI) was administered to all students enrolled in the course at the beginning and at the end of the course. The students were randomly divided into experimental and control groups. Members of the experimental group were assigned to children and youth groups of the city. In addition, they received class instruction. Members of the control group received traditional class instruction only. By use of the t-test, it was found that both experimental and control groups from pre- to post-tests made significant gains (0.01 level). Difference between groups did not reach the 0.05 level. It was concluded that a change in attitude can be attributed to instruction, rather than to field experience.

DARRON, Harriet Driskell. "The Relationship of Certain Factors to Performance of Elementary Student Teachers with Contrasting Success Records in Student Teaching," Unpublished doctoral dissertation, Indiana University, 1961.

The purpose of this study was to determine what relationships exist between performance in student teaching on the elementary level at Indiana State College (ISC) and certain selected variables. The sample consisted of 97 students enrolled in student teaching at ISC. The instruments used were the Minnesota Teacher Attitude Inventory (MTAI), the Iowa Test of Educational Development (ITED), the American Council on Education Psychological Examination for College Freshmen (ACE), the Nelson-Denny Reading Test (NDRT), Test on Social Usage and high school rank (percentiles). The students were divided into three groups according to the student teaching supervisor's recommendation. All variables were intercorrelated. It was found that the best predictor of student teaching success was the point hour ratio. It was concluded that point hour ratio should be an important factor in predicting success in student teaching.

DARRON, Harriet Driskell, "The Effects of a Participation Program on the Attitudes of Prospective Teachers at Indiana State Teachers College," THE TEACHERS COLLEGE JOURNAL, 1959, Volume 31, pp. 18-21.

The purpose of this study was to determine the extent to which limited participation in a laboratory school changes the attitudes of prospective teachers toward children and the profession. Over 200 students preparing to become elementary and secondary school teachers were placed in classrooms for a one-hour period for two weeks. The Minnesota Teacher Attitude (MTAI) was used to measure change in attitudes at the beginning, during, and at the end of the test period. Comparison of this group with a control showed that no significant difference existed between groups. The writer did, however, suggest that the participation program be continued since it seemed to reinforce the learnings of students in the psychology course they were taking at the time.

DAVIS, O. L. and BOWERS, Norman D. "Group Sensitivity Training in A Teacher Education Program: an Initial Attempt" PEABODY JOURNAL OF EDUCATION, Volume 39, 1961, pp. 68-74.

The purpose of this study was to attempt to ascertain whether sensitivity to individual student problems can be fostered within the teacher education curriculum. A group of fifth year students in professional education for the first time were encouraged to participate in group activity. The initial number of 23 students was later subdivided into smaller groups. Lectures to the students were concerned with "Maintenance and Cohesiveness of Groups", "Problem Solving in Small Groups", etc. At the end of a two-week period, a questionnaire containing four items was administered. In addition to this general questionnaire, another, "With Whom Would You Choose", a sociometric questionnaire, was given. The "Bills Index of Adjustment and Values" (IAV) was also administered both before and after the two-week period. It was found that on ten of the sociometric questions and the IAV there was no significant change. However, at the end of the period there was a significant change when students were asked to list best friends on the sociometric instrument.

DIXON, W. Robert and MORSE, William C. "The Prediction of Teaching Performances: Empathic Potential," JOURNAL OF TEACHER EDUCATION, Volume 12, September 1961, pp. 322-329.

This is a study involving 97 student teachers and more than 2000 secondary school pupils to discover whether student teachers who receive "good" empathy scores from pupils' ratings are perceived as better teachers. It was found that individuals who had high empathy capacity as measured by pupils' responses were also seen as better teachers. Supervising teachers saw the "good" empathy group as being significantly (1 percent level) better teachers than the "poor" empathy group. It was concluded that the dimension which may have the most potential for predicting the empathic attribute appears to be tied up with an individual's concept of his role as a teacher.

DRAVES, David D. "A Study of Class Size and Instructional Methods," Unpublished doctoral dissertation, The University of Wisconsin, 1957.

The purpose of this study was to determine if students learn more in small classes than in large classes. Five classes of one professional undergraduate education course, Education 75, of the University of Wisconsin, were studied during the first semester of the 1956-1957 academic year. There were two large classes of 59 and 64 total enrollment and three small classes of 28, 30 and 31 students. The instruments used were an achievement test and an attitude scale. Pre- and post-administrations were made. It was found that the mean achievement of all small class students was higher than that of all large class students on eleven measures made of student achievement; likewise, their mean attitudes were more favorable on all items of the attitude scale. The difference in means was in no instance critical (greater than one standard deviation).

EDMUND, Neal and HEMINK, Lyle H. "Do Student Teachers and Supervising Teachers Communicate With Each Other?" JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, May 1960. pp. 355-357.

The author's purpose was to determine to what extent student teachers in elementary education and classroom supervisory teachers in public schools agree on students' areas of greatest and least success. Thirty-seven randomly selected students, upon completion of student teaching, were asked to list five areas of teaching in which they felt they had experienced greatest success and five areas in which they had experienced least success. Their 37 supervising teachers supplied the same information for each student. Percentages of agreement were computed and the following findings reached: (1) students and teachers agree more frequently on areas of greatest success, though the difference when compared to areas of least success seems negligible; (2) the low percentage of agreement must be interpreted as an indication of poor communication; (3) little or no attention was given by respondents to the student success or failure in teaching subject matter.

FOWLER, H. Seymour. "Evaluation of an Institute for the Training of Elementary School Science Resource Teachers," THE JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, May 1960, pp. 358-359.

This study was designed to determine the growth in achievement in general science of 45 persons attending a National Science Foundation Summer Institute for training elementary school science resource teachers. Form AM of the Read General Science Test was administered to participants prior to and Form BM at the conclusion of six weeks of instruction. The "t" test was employed on the results of the examinations. It was determined that the "t" of the comparison of correlated samples was 9.9, which the author states "indicates a very significant gain in the achievement in general science."

FREEDMAN, Philip I. "Methods of Observation in Pre-Service Teacher Training," TEACHER EDUCATION NEWS AND NOTES, Volume 15, September 1963, pp. 1-4.

This was a study of observation methods in a pre-service course dealing with language arts methodology, health instruction and the principles of education in the elementary school. Prior to the first experimental semester, over 50 kinescopes were made using the Hunter College television facilities. Public school teachers and classes were brought to the college for this purpose. Hunter College Elementary School classes were also recorded, as were diagnostic and remedial reading demonstrations by a member of the Educational Clinic. Subjects were Park Avenue Hunter elementary education students, randomly assigned to one of the experimental sections. Six sections were established, two for each of the observational techniques (direct observation DO; closed circuit television TV; and Kinescope K). Each class was exposed to a total of eleven demonstration lessons during the semester. Two criteria were employed. The first was an improvement score derived from the difference between the scores made on a 120-item, multiple choice, methodology examination which was administered on the first day of the semester and the score compiled on the identical examination given at the end of the semester. The second criterion consisted of a written evaluation of a specially prepared lesson which was viewed by each section, using the observational techniques. A three by two by two analysis of variance design (completely balanced randomized blocks) was applied to methodological examination. It was found that: (1) no significant differences existed between the three modes of observation; (2) methodological difference score was sufficiently sensitive to vary with several other experimental factors. In contrast to the methodology examination results, the data from the Lesson Evaluation Analysis yielded significant differences among the three observational patterns. The hypothesis that kinescope would be superior to live television, and live television superior to direct observation was confirmed.

FULTON, W. R. and RUPIPER, O. J. "Observation of Teaching: Direct Versus Vicarious Experiences" JOURNAL OF TEACHER EDUCATION, Volume 13, June 1962, pp. 157-164.

This investigation was designed to determine whether vicarious observations of education situations made during the professional training of preservice teachers prior to student teaching were as effective as observation of similar situations made directly. This study was conducted at the University of Oklahoma, using students from three classes in professional education. Two instructors with comparable qualifications taught two sections each of "The School in American Culture", "Human Growth and Development", and "Educational Evaluation and Guidance". Each instructor taught one class which directly observed children and a class which saw motion pictures of children as a substitute for direct observation. Pre- and post-achievement tests were given. Other instruments used were: the Cooperative School and College Ability Tests (SCAT), the Minnesota Teacher Attitude Inventory (MTAI), and the Social Class Identification Occupational Rating Scale (SCI). The data derived from the test were used to compute a correlation matrix. It was found that statistically significant positive correlations were found between pre-achievement tests and the SCAT verbal scores, r=0.77, r=0.66, and r=0.65 with probabilities less than the 0.01 level. Only one significant positive correlation existed between MTAI and post-test scores (0.01 level). This occurred in Educational Evaluation and Guidance. For "The School in American Culture", the results of an analysis of covariance test of significance showed that the difference between methods of observational experiences was significant with an F ratio of 8.42 (0.01 level). For "Human Growth and Development" and "Educational Evaluation and Guidance" the analysis of covariance yielded F ratios of 0.15 and 0.13 (0.05 level). It was concluded that problems associated with direct observations can be alleviated by use of appropriate audio-visual materials.

GORDON, Ira J. "THE FLORIDA EXPERIMENT IN UNDERGRADUATE TEACHER EDUCATION" Case Study, Section 15, The Columbus Conference, June 26, 1963.

Fifty-seven students registered for a course in Human Growth and Development were selected for this study. All students were prospective teachers. A control group of similar size was also selected. An initial comparison of the two groups of students was made with use of the Edwards Personal Preference Schedule, Thurstone Temperament Schedule, and Jourard's Self-Disclosure Scale. Instructors were asked to take a laboratory approach (a psychological rather than a logical approach) in the teaching of Human Growth and Development. At the end of the experimental period it was found that the control group responded in terms of content, and the experimental group in terms of processes when asked to evaluate on an open-ended questionnaire. The only other significant difference between two groups uncovered on the questionnaire was in attitudes toward reading, in which the experimental group differed at the 0.01 level in expressing more positive attitudes toward reading than did the control group.

GORDON, Ira J. and SPEARS, William D. "INTERPERSONAL PERCEPTION: THE EFFECT OF TRAINING IN PERCEPTUAL THEORY, OBSERVATION AND ANALYSIS OF BEHAVIOR UPON ACCURACY OF PREDICTION OF CHILDREN'S SELF-REPORTS" Gainesville, University of Florida, 1962 (Mimeographed).

The purpose of this study was to determine if training students in perceptual self theory, in observing child and adolescent behavior, and in the analysis of such behavior from a perceptual orientation, would increase the ability of the students to infer accurately a child's statement about himself. The subjects for this study were 69 students who registered for a total of three sections of an upper division course in Human Development during the spring semester 1960. The control groups were selected so as to include a number of subjects who had taken previous course work, including observation experience with children, and subjects who did not have such experience. There were 101 control subjects who were divided into two groups. The three groups were given pre- and post-tests on three instruments called Debbie, Alice, and John, to infer their ability to infer the self reports of these pupils. They were provided with observation data on the three pupils and completed a "How I See Myself" rating scale the way in which they thought the pupils completed the scales. Correlations were computed for each subject with each pupil, and transformed into Fisher Z's. A "pseudo-four way analysis of variance design" was used to test the effect of training upon ability to infer. The hypothesis, that training in perceptual theory, observation and analysis of behavior would increase the ability to infer children's self-reports was not substantiated. This study, however, led to the development of an instrument, Debbie and Alice, which reliably detects the differences between individuals in their ability to infer self-reports from mimeographed observational data.

GRAY, Loren and GREENBLATT, Edward L. "An Experiment in Team Supervision," JOURNAL OF TEACHER EDUCATION, Volume 14, June 1963, pp. 154-162.

The experiment described is one in which two specialists, one in educational psychology and the other in elementary curriculum and methods, formed a supervisorial team designed to facilitate the progress of a group of student teachers. The intent of the design was to permit separate viewpoints concerning human behavior and instructional practices in the elementary classroom to focus simultaneously on problems encountered by the student teacher. The Dogmatism Scale, The Situations Perception Test, and The Agree-Disagree Scale were instruments used in the study. Pre- and post-tests were administered to a total of nine students--one male and eight females. No control group was involved. From an analysis of the test results, it was found that there was a slight tendency for student teachers to perceive child behavior more negatively at the end of the term. Secondly, it was found that the student teachers perceived more of a necessity to control and direct the activities of the children in even free play situations at the end of the term than they did at the beginning. Information resulting from this study was used in an attempt to lessen student anxieties.

HOOVER, Kenneth H. "Degree of Teacher Domination in Group Processes and Student Attitude Toward Instruction in Secondary Methods Classes" JOURNAL OF EDUCATIONAL RESEARCH, Volume 56, March 1963, pp. 379-381.

This study was an attempt to determine the relative influence of teacher-centered, pupil-centered, and group-centered instruction upon attitudes toward both the instructor and the teacher education course involved. Each of three classes was taught by teacher-centered methods for approximately twelve weeks.

Student attitudes were then determined by administering the Purdue Rating Scale for Instruction. For an additional six weeks one class continued a teacher-centered approach, one experienced pupil-centered instruction, and the third was group-centered in instructional approach. The Purdue Rating Scale was then re-administered to the three groups and comparisons of the attitude change were made by means of analysis of variance. No significant differences were discovered between any of the variables studied.

HOUGH, John B. and AMIDON, Edmund J. "BEHAVIORAL CHANGE IN PRE-SERVICE TEACHER TRAINING: AN EXPERIMENTAL STUDY." Philadelphia, Pennsylvania: College of Education, Temple University, 1963 (Mimeographed).

The purpose of this study was to investigate the effect of an experimental pre-service experience on change in teacher classroom behavior. The experimental design included the following groups: (1) an experimental group of twenty students, all of whom were enrolled in the course, The Teaching-Learning Process (T-LP); and (2) a control group of twenty students. Students in the experimental group did student teaching while enrolled in the T-LP course. Control group students took the traditional methods seminar as scheduled. The T-LP course was designed to give the students an opportunity to learn and use Interaction Analysis as a means of analyzing principles of learning and teaching as they applied to theoretical problems of instruction and to the students' own teaching behavior during student teaching. An attempt was made to have students analyze their own behavior in the laboratory and in their student teaching. The Teaching Situation Reaction Test, the D Score, two student teaching observational rating scales and an evaluation form were the criterion instruments. The statistical methods employed were analysis of variance and the t-test. It was found that significant difference favoring the experimental group was found on the TSRT (0.05 level) and on the General Scale (0.05 level). It was also found that students in the experimental teaching and learning theory course perceived their course as more challenging, interesting and professionally meaningful than students in the conventional sections.

IRISH, Elizabeth H. "Behavior Can Serve as a Guide to Improving Discipline," JOURNAL OF TEACHER EDUCATION, Volume 12, December 1961, pp. 449-452.

This study is intended as an analysis of children's comments about their student teachers. Unstructured comments were secured from 149 children over a two-year period (four groups of sixth-grade children and one group of fourth graders added the second year to check some of the findings reported at the sixth-grade level). The data yielded 1789 different comments, of which 667 were categorized as positive responses under 11 separate headings. The negative comments yielded 19 separate categories and a total of 1122 responses.

It was found that both children from high and low socio-economic backgrounds most frequently mentioned as negative traits "bossiness", "yelling and lack of self-control", and "being too easy". On the positive side, a large proportion of the children referred to "help with problems", "making work interesting", and "providing added help in the classroom". It was concluded that if the results of this limited survey are in any way indicative of the facts, student teachers are incorrect in their assumption that most of their problems in discipline result from divided authority in the classroom and their "inferior" status as student teachers.

JOHNSON, Granville B., Jr. "A Method for Evaluating Research Articles in Education," JOURNAL OF EDUCATIONAL RESEARCH, Volume 51, October 1957, pp. 149-151.

This project had as its purpose the establishment of a method for the evaluation of scientific research articles in the field of education. The evaluative instrument used was a rating scale of 5 quality degrees concerned with the (1) problem, (2) materials, (3) subjects, (4) method of procedure, (5) results and (6) conclusions of research articles. Fourteen students two weeks before completing a graduate course in educational research methods each read, abstracted, and evaluated 20 research articles using this instrument. Four members of the staff of the department of education evaluated the same articles and constituted the criterion group. The interrelationship between student evaluations was R=0.75 significant at the 0.01 level. The relationship between student and expert evaluations was R=0.78 significant at the 0.01 level. The interrelationship between expert relationships was 0.79 significant at the 0.01 level. The experts tended to rate those articles highest which dealt with an area of interest to them. Students tended to have greater agreement with some teachers than with others. The author states that the study indicates that the suggested method of evaluating research articles might be used with profit as a frame of reference at both the graduate and undergraduate levels.

JOHNSTON, June S. "Professional Laboratory Experiences Provided Elementary Majors in Southern Education Programs," Unpublished doctoral dissertation, The University of Tennessee, 1962.

The purpose of this study was to identify and analyze certain aspects of professional laboratory experiences provided elementary education majors in southern teacher education programs. Data were obtained by a questionnaire and from college catalogs for the academic year 1960-61. A total of 50 institutions were surveyed. It was found: (1) that only 20 percent of the institutions provided professional laboratory experience as an integral part of course work throughout the entire college program; (2) students were admitted to the student teaching experience on the basis of indication of readiness for internship in 24 percent of the institutions; (3) provisions were made for post-student teaching experience in only 14 percent of the institutions; (4) forty-four percent of the institutions had no policy or formula for determining work loads of staff members supervising student teachers.

KOSTICK, Max M. "An Experiment in Group Decision" JOURNAL OF TEACHER EDUCATION, Volume 13, March 1957, pp. 67-72.

This study was an effort to determine if group decision can raise the aspiration level of students' work. The study was conducted at State Teachers College in Boston. The freshman class of 200 was divided into sections according to elective subject. Out of 5 sections, 4 sections were as follows: music (two sections), history (one section), and French (one section). The instructor in the professional education gave the same lecture to all sections. One class of 26 students was used as the experimental group. The other classes composed the control group. The only difference in instruction between the control and experimental group was the process of group decision which grew out of a 40-minute discussion culminating in group decision to improve course marks by at least 5 points. The experiment was investigated by using the analysis of covariance to statistically determine if change in test scores could reasonably be attributed to chance. By using the analysis of covariance, it was found that students in the experimental group scored significantly higher (0.01 level) than students of the control group. The major conclusion of this study is that the technique of group decision can effectively be applied in the classroom in raising the level of scholastic aspiration.

KUHL, Raymond E. "Time for Student Teaching," JOURNAL OF TEACHER EDUCATION, Volume 12, March 1961, pp. 43-47.

The purpose of this study was to determine the opinions of public school supervising teachers and principals regarding the time arrangement for student teaching. It was found that the supervising teachers indicated a strong preference (77 percent) for a system of student teaching and observation which involved an all-day session lasting for a semester. Supervising teachers found its value in the long, uninterrupted period of time sufficient to develop a teacher and, at the same time, benefit the pupils and co-operating teachers. Student teaching all day for a half semester in the junior year and a half semester in the senior year was selected by 13 percent of the respondents. The remaining 19 percent respondents selected a variety of other systems.

LETON, Donald A. "An Evaluation of Course Methods in Teaching Child Development" JOURNAL OF EDUCATIONAL RESEARCH, Volume 55, November 1961, pp. 118-122.

There was a twofold purpose in this research: first, to compare the relative efficacy of three methods of college teaching (lecture, case-centered and group-centered) and second, to determine whether students' attitudes toward children are measurably influenced by a course in child development. Three randomly selected classes of elementary education students constituted the population. Each section was taught utilizing exclusively one of the instructional methods to be tested. Each student was pre- and post-tested on the Minnesota Teacher Attitude Inventory and Schoben-Parent Attitude Survey. In addition, midterm and final examinations determined student achievement. The achievement for the sections were compared, utilizing analysis of variance. Change scores on the MTAI were correlated with change scores on the PAS, and the "t" test was used to determine the significance between means of pre- and post-test scores. The findings were as follows: (1) achievement or attitude change in the course in Child Development as measured by course tests is not significantly related to teaching method; (2) significantly favorable changes in attitudes toward children were a result of the course experiences; (3) the two attitude instruments used in this study were significantly related to each other; and (4) change scores on attitudinal measures were significantly correlated with achievement scores.

LINDGREN, Henry Clay and PATTON, Mary. "Attitudes of High School and Other Teachers Toward Children and Current Educational Methodology" CALIFORNIA JOURNAL OF EDUCATIONAL RESEARCH, Volume 9, March 1958, pp. 80-85.

The purpose of this study was to determine if high school teachers are less favorably disposed toward children and toward current instructional theory and practice than are elementary teachers. A 50-item questionnaire dealing with teacher-child relationships was administered to 216 elementary and secondary practicing Teachers enrolled in 14 in-service courses offered by San Francisco State College. When the questionnaire was scored with a key based on favorable attitudes toward children and acceptance of current educational theory and practice, non-high school teachers (N=55) scored higher than high school teachers. The difference was significant at the 0.05 level of confidence (t-test). It was concluded that the five items that evoked the most disagreement on the part of the majority of these teachers indicates the existence of "areas of resistance" to research findings and to current psychological theory.

MACDONALD, James B. and DALL, Ronald C. "Who is Ready for Teacher Education?" JOURNAL OF EDUCATIONAL SOCIOLOGY, Volume 35, November 1961, pp. 123-127.

The purpose of this study was to compare changes in attitudes and values of a younger (age 21-25) group of teachers in training with an older (age 25-40) group of prospective teachers. To the older (N=20) and the younger group (N=20) the Minnesota Teacher Attitude Inventory (MTAI) and the Kerlinger Educational Values Scales ESI and ESII were administered in September and the following May. Both groups underwent a graduate program of teacher education for graduates of liberal arts curricula. The Median Test statistic was utilized to test the differences in changes during the eight-month period for both groups on these measures. Analysis of the data by the Sign Test showed that both groups had made statistically significant growth during the eight-month period (0.01 level or beyond). Although the younger group began with higher scores, post tests indicated a complete reversal, with the older group having higher final scores. It was concluded that readiness, related to age, is an important factor in teacher attitude growth.

MACPHAIL, Ned Brown. "The Effects of Television Training on the Quality of Lesson Presentation", Unpublished Doctoral Dissertation, George Peabody College for Teachers, 1962.

This study was designed to explore the possibility of a cause and effect relationship between training in the use of television techniques and improved teacher competency. An experimental training program was administered to elementary student teachers randomly assigned to two experimental groups. The effects of the training was measured by comparing the performance of these students with the performance before and after the training period. The average gain scores of these subjective judgments were statistically analyzed for variability between experimental groups. One experimental group was trained with and the other was trained without television in lesson presentation. Quality of lesson presentation was the single criterion measure of subject performance. Quality was determined by four raters. It was found that the use of television did not alter significantly the effectiveness of the training on the performance of the students.

MCNEIL, John. "An Experimental Effort to Improve Instruction Through Visual Feedback" JOURNAL OF EDUCATIONAL RESEARCH, Volume 55, March 1962, pp. 283-285.

The hypothesis tested in this study was that if student teachers were provided with immediate knowledge of selected effects of their teaching upon pupils during instruction (feedback), then these teachers would more rapidly acquire a larger repertoire of appropriate teaching behaviors. The five-week performance of three groups of student teachers was studied using pre- and post-evaluations by pupils of the student teachers effectiveness as the criterion measure. Teachers in the experimental group systematically prepared multiple-choice questions related to the day's instructional objective. Each pupil responded immediately to these questions by means of a four-colored "answer light". The student teacher was instructed to note the responses and to reteach as necessary before continuing the sequence of instruction. Teachers in one control group regularly asked questions to ascertain whether or not pupils understood, but had no special channel for receiving the information. Teachers in a third group taught without experimental arrangements. Correlation coefficients between practice-ratings at the beginning and terminal periods indicated no significant change with respect to the frequency of appropriate teaching behavior in either experimental or control groups. It was concluded that the kind of information needed for improved performance by the teacher must be more than "immediate knowledge of results".

MEEKS, Clinton R. "An Experiment in Teaching Empathy", JOURNAL OF EDUCATIONAL SOCIOLOGY, Volume 31, November 1957, pp. 97-106.

To see if the empathic ability of students in teaching could be improved by direct efforts to teach empathy, a class of 36 students in Introductory Guidance was used as an experimental group and another section of 56 in the same course was used as a control group. Both groups were given empathy tests before the unit of work was presented. A concerted effort was made to teach empathy in the experimental group, and the control group received no such treatment. The same tests were administered to both groups four weeks later when the unit of work on empathy was completed. The Psychological-Mindedness Scale on the California Psychological Inventory (CPI) was used as one empathy measure. Students were also asked to rank traits in judging oneself and others. The empathy scores on the first test and the final test were compared. It was found that the experimental group showed an improvement (significant at the 0.01 level) in the ranking test, but there was no change in the inventory test. The control group showed no significant change on either the ranking or the CPI. It was concluded that if empathy can be taught, better devices for teaching it must be sought.

MICHAELIS, John V. THE PREDICTION OF SUCCESS IN STUDENT TEACHING FROM PERSONALITY AND ATTITUDE INVENTORIES Berkeley: University of California Press, 1954.

The major purpose of this study was to determine the degree of accuracy with which success in student teaching could be predicted by means of objective measures of personality and of attitudes of student teachers toward children and teaching. Three inventories--the Minnesota Multiphasic Personality Inventory, the Heston Personal Adjustment Inventory, the Minnesota Teacher Attitude Inventory were administered to subjects enrolled in elementary school student teaching. Both empirical and validation groups were utilized in the study. The sample was controlled with reference to age, level of teaching, and sex. The criterion of success in student teaching consisted of ratings made jointly by supervisors and supervising teachers. Four aspects of teaching were included in the rating form: personal relations, command and use of subject matter, use of teaching procedures, and class management. Two ratings were made for each student and combined in one composite rating. A reliability coefficient of 0.82 was found when the correlation between first and second ratings were calculated on a sample of 146 students. A reliability coefficient of 0.70 was found when the correlation was computed between ratings made independently by supervisors and supervising teachers on a sample of 69 students. The ratings were used as a basis for grouping students into high, average, and low subgroups. Empirical groups of students were utilized to make a preliminary test of the predictive value of the subtests contained in the inventories; this step involved the calculation of reliability coefficients and the estimation of the differential power of each subtest. Reliability coefficients were computed by means of the split-half method, and were stepped up by The Spearman-Brown formula. The t-test of mean differences between students with high ratings and those with low ratings were used to estimate differential power of the subtests included in the inventories.

MOE, Richard David. "An Analysis of Objectives, Materials, and Methods Used in Teaching the Introductory Course in Education in Selected Accredited Colleges and Universities", Unpublished doctoral dissertation, University of Colorado, 1962.

The purpose of this study was to analyze the objectives, materials, and methods used in teaching the introductory course in Education. A total of 311 questionnaires were sent to public and private colleges in the six regional accrediting districts. Of the 311, 157 were usable for the study. It was found that discussion by the instructor and class, the lecture, or a combination of these two were the most widely employed methods used in teaching the introductory course. Observation of elementary and secondary school classroom teaching was required by two-thirds of the colleges and universities in the study. Evaluation of the methods used in the course was generally accomplished by giving course examinations. In comparing the results of this study with others done a decade ago, it was concluded methods and procedures have not changed greatly, although the course now gives more emphasis to the foundations of education.

NEARING, Charles Lynn. "The Use of Kinescope Recordings for Observation of Classroom Situations in a Beginning Teacher Training Course", Unpublished Doctoral Dissertation, Michigan State University, 1962.

In this study educational outcomes of observation by kinescope recordings and by field trips were compared for a sample of 418 students in the beginning teacher education course at Michigan State University. The morning and afternoon lecture sessions were held, each of which was divided into six discussion groups (N-418). Six instructors each taught one morning and one afternoon discussion group. The 12 discussion groups were differentiated into four made up of students interested in elementary teaching, four of students interested in secondary teaching, and four mixed. Half of the morning students and half of the afternoon students were shown a two-hour program of kinescope recordings of classroom situations; the other half made all-day field trips to area schools where they observed in one or more classrooms for about five hours. Six instruments were used in determining the growth which occurred in each group--the Minnesota Teacher Attitude Inventory, The Misconceptions of Education Scale, the Career Plans Questionnaire (CPQ), the Course Evaluation Scale, Course Grade, and Evaluation of Observation Experience Scale (EOE). The data was subjected to an analysis of variance and t-tests. Pre- and post-tests were analyzed. The findings showed no significant differences between methods of observation except on the CPQ and the EOE. Significant differences by discussion group instructor were indicated by scores on the MTAI, the CPQ, and the CES. Course grades were significantly higher for afternoon students.

OFCHUS, Leon T. and GNAGEY, William T. "Factors Related to the Shift of Professional Attitudes of Students in Teacher Education" JOURNAL OF EDUCATIONAL PSYCHOLOGY, Volume 54, June 1963, pp. 149-153.

This study was designed to explore some relationships between the student-class-course-instructor complex and changes in student attitudes toward teaching children as measured by the Minnesota Teacher Attitude Inventory (MTAI). Seventy-one students at Illinois State Normal University were given the MTAI before and after a one semester course in child growth. Using the California F Scale and a personal rating form, inquiry was made into correlates of attitude shifts during the course. Although student perception of instructor's competence, permissiveness, and attitudes seemed not to be related to attitude shift, student ratings of their own parents were significantly associated with their perceptions of the instructor. A negative correlation (r=0.58), significant at the 0.01 level, was found between the California Scale scores and those on the MTAI. It was concluded that neither the students' authoritarianism, nor their perception of the instructor's competence, permissiveness, and agreement with their own attitudes toward children were associated with a change in the student's professional attitude as measured by the MTAI.

PERRODIN, Alex F. "In Support of Supervising Teacher Education Programs" JOURNAL OF TEACHER EDUCATION, Volume 12, March 1961, p. 36.

This is a report of a study conducted at the University of Georgia which seeks to determine the difference in growth of those

2

students who serve with trained cooperating teachers and those who do not. The Minnesota Teacher Attitude Inventory (MTAI) was administered to 113 elementary education majors prior to and following the student teaching experience. The 113 cases were ranked according to the amount of gain in raw scores between the first and second administration (12-week interval). It was found that student teachers placed with trained supervising teachers tended to make better MTAI scores than did those placed with relatively untrained supervising teachers.

PINCKNEY, George A. "Changes in Student Teachers' Attitudes Toward Childhood Behavior Problems" JOURNAL OF EDUCATIONAL PSYCHOLOGY, Volume 53, December 1962, pp. 275-278.

This was a study to determine the extent to which a course influences attitudes of student teachers. An experimental group for this study consisted of 203 undergraduate students enrolled in six sections of an introductory educational psychology course at Teachers College, University of Nebraska. The control group was composed of 58 students enrolled in the same college, but who had not taken course work in any area of psychology. The subjects were presented with a list of 32 behavior traits. They were asked to rank these traits using a nine-point Q-sort technique. The control group also sorted in the same manner. The same procedure was followed at the end of the school year. A correlational analysis showed that the amount of change in attitude of the experimental group was significant at the 0.01 level. The change in attitude of the control group was insignificant. It was concluded that introductory courses in psychology can meet the needs of student teachers for better understandings of the basic principles of human behavior.

POPHAM, W. James and STANDLEE, Lloyd S. "'Snap' Courses in Teacher Education?" JOURNAL OF TEACHER EDUCATION, Volume 11, March 1960, pp. 31-32.

The purpose of this study was to determine whether grades received by teachers in their undergraduate professional education courses are significantly higher than their grades in non-professional courses. Subjects for the investigation were 804 public school teachers who graduated from 24 teacher training institutions in Indiana. The 24 institutions represent all types of colleges and universities, i.e., large, small, public, sectarian, non-sectarian, etc. The institutions submitted transcripts from which the following data were obtained for each subject: (1) cumulative grade point average for undergraduate professional courses (education and psychology) and (2) a cumulative grade point average for undergraduate non-professional courses (all courses except education and psychology). The mean GPA for both sets of data was subjected to a t-test for correlated data. Analysis revealed that the differences were not statistically significant. It was concluded that the commonly held notion about "soft" grading practices in education courses is nothing more than a popular misconception.

PORTER, Robert M. "Student Attitudes Toward Child Behavior Problems" JOURNAL OF EDUCATIONAL RESEARCH, Volume 52, May 1959, pp. 349-352.

This study had a two-fold purpose: (1) to ascertain how undergraduate teacher education students felt certain child behavior problems should be handled, and (2) to ascertain the improvement in student attitudes as they progressed through four years of college. A test previously devised by Celia Standlo containing 25 open-ended response statements regarding child behavior was administered to 60 each of the following student groups: (1) high school seniors, (2) college freshmen, (3) college sophomores, (4) college juniors, (5) college seniors, (6) in-service teachers. Responses were organized by percentages in the Standlo categories. Findings indicated that: (1) The technique most selected by high school seniors to handle the behavior problems presented was punishment. All four college classes favored talking to the child. In-service teachers favored adjusting the work; (2) There was a sharp drop in the election of the use of punishment from high school seniors to college seniors; (3) Punishment was especially chosen to deal with overt behaviors which disrupt the classroom; (4) Seldom would any group tested seek to handle a behavior problem by sending the child to a physician; (5) There was a tendency to handle problems of subjective nature, involving some personality maladjustment, by adjusting the work, especially among the older testees; (6) There was a decided tendency for older groups to move more and more toward a mental hygienist view that the best technique for behavior problems is to seek the cause; (7) The general consensus of all groups was that the most serious behavior problems involved unhappiness and moodiness, stealing, being disliked by others, fighting, and truancy.

PRICE, Robert D. "The Influence of Supervising Teachers", JOURNAL OF TEACHER EDUCATION, Volume 12, December, 1961, pp. 471-475.

The purpose of this study was to determine to what extent supervising teachers determine the attitudes and performances of the student teachers they supervise. The University of Texas personnel administered the Minnesota Teacher Attitude Inventory (MTAI) to all elementary teachers in Austin, Texas, expecting to supervise student teachers during the spring of 1960. The investigator divided the teachers into "high", "low", or "middle" groups, depending on scores received on the MTAI. The MTAI was also administered to student teachers before assignment to supervising teachers. Students were matched with supervising teachers of different categories, i.e., high-low, high-middle, etc. After student teaching, students were again given the MTAI. The results of the F-tests indicated that no significant changes were discovered in the homogeneity of the student teachers' MTAI scores after one semester of student teaching. An analysis of variance indicated that the high, middle, and low groups of student teachers revealed score changes which were significant at the 0.05 level of confidence. It was also discovered that the correlation between performances of the total group of cooperating teachers and their respective student teachers was significant at the 5 percent level of confidence. It was concluded that student teachers acquire many of the practices of their cooperating teachers; therefore, only the best cooperating teachers should be used.

RASMUSSEN, Glen R. "An Evaluation of A Student-Centered and Instructor-Centered Method of Conducting A Graduate Course in Education", JOURNAL OF EDUCATIONAL PSYCHOLOGY, Volume 47, December 1956, pp. 449-461.

This study was designed to investigate the effectiveness of two learning situations. The following goals were sought in using an instructor-versus a student-centered approach to teaching. The courses were to help students know as much as possible about child psychology and to help them use this knowledge to guide their teaching behavior. An instructor-centered (N=121) approach was used in four sections and a student-centered (N=141) approach was used in nine sections of class entitled "The Psychology of Child Development" offered by a large midwestern university. Ninety percent of the study group were experienced school teachers, eighty-one percent were in the graduate school, and seventy-four percent were parents. A questionnaire was administered at the end of the course and again six months after the course was over. It was found that the difference between the achievement of the two groups was significant at the 0.01 level, in favor of the student-centered group. Six months after the completion of the course, the student-centered sections also scored significantly higher (0.01 level) in retention than did the instructor-centered group.

RUHL, Raymond E. "Time for Student Teaching", JOURNAL OF TEACHER EDUCATION, Volume 12, March 1961, pp. 43-47.

A survey was conducted among cooperating teachers of Millersville State College, (Pennsylvania) to determine the best time arrangement for student teaching. A questionnaire was sent to 208 cooperating teachers randomly selected. A total of 144 usable questionnaires was returned. It was found that these teachers exhibited a strong preference (74 percent) for all-day student teaching for a semester as opposed to part-time student teaching for the same period ot time. It was concluded that cooperating teachers felt that all-day student teaching provides the best possible experience for an education student soon to take over his own class.

RUMFORD, Herbert P. "An Experiment in Teaching Elementary School Methods via Closed Circuit Television" JOURNAL OF EDUCATIONAL RESEARCH, Volume 56, November, 1962, pp. 139-143.

This investigation was designed to determine the effectiveness of television as a means for teaching a methods course involving the observation of classroom teachers in action. Two matched groups of students experienced a common lecture and common observations of laboratory school pupils being taught. One group viewed these facets of the course on television while the other experienced them live. The t-test was used to test the significance of differences in related means and variances on the measures involved, and the Wilcoxon matched pair signed-ranks test was used as a non-parametric test for the significance of differences when the groups were considered separately by ability levels. The following are among the findings: (1) televised lectures were as effective as conventional instruction in bringing about increases in knowledge as measured by teacher-made objective tests; (2) televised observation of classroom procedures was as effective as direct observation as measured by teacher-made objective tests, but less effective than direct observations when students of high ability were considered separately; (3) television teaching was as effective as conventional instruction when the final examination, given four months after the end of the course, was used as a criterion of retention; (4) instruction by television was as effective as conventional teaching in bringing about changes in teacher attitude as measured by Minnesota Teacher Attitude Inventory scores; (5) students in the television group improved in teacher prognosis, as measured by the selected scale of the Minnesota Multiphasic Personality Inventory, while those in the conventional class did not.

SCHUH, Emily Bell. "An Evaluation of the Effectiveness of the Methods of Instruction in Teacher Education," Unpublished doctoral dissertation, The Ohio State University, 1959.

The purpose of this study was to discover the effectiveness of two methodological procedures in producing certain verbal and operational outcomes in two student groups. Seventy-six prospective elementary teachers were enrolled in two sections of a course in social education. The groups were not significantly different when pre-test scores, intelligence, attitude, and achievement were equated. One group was taught using the unit method, the other group was taught using conventional methods. It was found that each group made significant mean gains in achievement as measured by the pre- and post-tests. A correlation of 0.090 was found between post-test scores and group membership. Although both student groups reacted favorably in their evaluation of both methods, the unit method enjoyed a superior rating.

STEPHENS, Lester D. "A Study of the Relative Effects of Selected Teaching Procedures Relating to Differential Class Size on the Attainment of Objectives in an Introductory Survey Education Course," Unpublished doctoral dissertation, University of Miami, 1963.

It was the purpose of this study to investigate the relative effects of selected teaching procedures relating to differential class size on the attainment of objectives in an introductory survey education course. The population of this study was 414 students enrolled in Education 101, Introduction to the Study of Education at the

University of Miami. Students enrolling for the course were assigned at random to five sections: two small classes of 35 and 36 students each, two medium-sized classes of 76 and 78 students each, and a large class of 186 students. One instructor taught a small class, a medium-sized class, and the large class, and another instructor taught a small class and a medium-sized class. In the two small classes emphasis was on reports from small subgroups, brief individual talks, and the use of educational materials in the library. Emphasis in the medium-sized class was placed on group reports, use of educational materials, and lectures by the instructor. In the large class students met twice a week and listened to lectures by the instructor or guest lecturers. Analysis of variance was used to test for significance among mean scores of the groups on the Education Opinion Inventory (EOI). Analysis of covariance was used to test for significance of mean scores of the groups on a test of acquisition of functional information and understanding. The groups were equated for the covariance analysis on the basis of scores on a pre-test and total scores on the ACE examination. It was found that on the EOI the medium-sized classes had the highest mean score; the small classes had the next highest mean score; and the large class had the lowest mean score. The difference among mean scores for the groups was significant at the 0.01 level. On a measure of acquisition of function information and understanding the largest group had the highest mean score; the medium-sized groups had the next highest mean score; and the small groups had the lowest mean score. The difference among mean scores for the groups is significant at the 0.01 level. It was concluded that students' attitudes toward the teaching profession can be more effectively developed in medium-sized and small groups, and large class instructional methods are more effective for student acquisition of functional information and understandings.

TOMLINSON, Loren R. "An Attempt to Develop an Instrument for Measuring Professional Understandings in Elementary Education," JOURNAL OF EDUCATIONAL RESEARCH, Volume 51, May 1958, pp. 659-667.

Three specific purposes gave directions to this study: first, to explore the possibilities of developing a short-form paper-and-pencil instrument for measuring professional understandings in the field of elementary education; second, to utilize this and other instruments in the appraisal of the professional understandings of selected prospective elementary school teachers; third, to determine the relationship between scores made on the instrument by individuals, their success in student teaching, and certain factors in their backgrounds. A survey was made of the literature of elementary education, and ten general areas of knowledge were thus established. A total of 1200 five-response, multiple-choice items concerning these areas were constructed. These were refined through discriminative applications into two 60-item forms of an Inventory of Professional Understandings in Elementary Education. Both forms of the Inventory were administered to a group of 122 student teachers and 44 graduate students. The reliability of the test was computed from the coefficient of correlation between the scores on form A and form B; the resultant reliability coefficient of 0.717 is comparable to other tests of this type. In an attempt to apply external validation procedures, correlations were computed for the undergraduate student between scores on the two test forms, student teaching marks, point-hour ratios in professional courses, and scores on The Ohio State Psychological Examination. No single factor under consideration showed a significantly high degree of relationship with teaching success as measured by student teaching marks. The scores on the Inventory show a decidedly higher correlation with professional point-hour ratios and scores on the OSPE.

VELDMAN, Donald J. and PECK, Robert F. "Student Teacher Characteristics From the Pupils' Viewpoint" JOURNAL OF EDUCATIONAL PSYCHOLOGY Volume 54, December 1963, pp. 346-355.

This study describes the development of an instrument designed to reduce the everyday observations of pupils to reliable measures of important aspects of teacher behavior. A Pupil Observation Survey (POSR) was administered to students taught by 554 secondary school student teachers in the Austin, Texas City School District. It was administered after student-teaching had ended. The POSR is a 38-item questionnaire presenting a four-point scale of agreement after each statement. All statements on the instrument are phrased positively and attempted to measure pupils' reactions, as well as behavioral characteristics of the student teacher. Five factors were extracted from the evaluations on the POSR: Friendly, cheerful, admired, poised, knowledgeable, interesting, preferred, strict control and democratic procedure. After the administration of the POSR, student teachers were then asked to take the California Psychological Inventory (CPI) and the Self-Report Inventory (SRI). Supervisor ratings were also used in this study. Invariance of factor structure was demonstrated across three semester subsamples and across teacher-sex, and factor reliabilities were computed. Female teachers were given a higher mean score in the area of "Friendly" and "Democratic Procedure". Correlations of the OSR with the CPI and the SRI were low, but significant. Relationships of factor-scores to supervisor rated effectiveness were linear and positive for the areas "Friendly", "Poised" and "Strict Control", except for a curvilinear effect with males in the "Friendly" area.

WEDBERG, Desmond Phillip. "A Comparative Investigation of the Instructional and Administrative Efficiency of Various Observational Techniques in the Introductory Course in Education," Unpublished doctoral dissertation, University of Southern California, 1963.

The purpose of this study was to evaluate the instructional effectiveness of three alternative techniques of conducting school observation activities in an introductory professional education course. An experimental population of 151 students enrolled in the course were randomly assigned to three equivalent groups. The control group followed the traditional procedure of observing 30 hours off-campus in elementary and secondary schools. One experimental group received 10 hours of observation experience on campus through locally produced audio-visual material, followed by 10 hours of direct observation off-campus. The second experimental group received 10 hours of observation experience by audio-visual material only. Criterion data included an informational post-test and a measure of student and staff attitudes toward the three techniques. Statistical measure included analysis of variance, t-test, chi-square, and proportional analysis. It was found: (1) that the informational post-test achievement of the two experimental groups was very significantly superior to the achievement of the control group; (2) that the 20-hour technique proved superior in instructional and administrative efficiency when evaluated against current objectives of the observational unit; (3) that teacher trainee attitude toward the techniques revealed that both the 20-hour and 30-hour groups considered their particular technique worth of time expended in terms of objectives of the observation unit; and (4) teacher training staff attitudes were favorable to the experiment and in agreement with trainee attitudes. It was concluded that an introductory course should be offered which would combine the strengths of the on-campus and off-campus techniques and use instructional media most operationally efficient to the desired course learning outcomes.

WITTROCK, M. C. "Set Applied to Student Teaching," JOURNAL OF EDUCATIONAL PSYCHOLOGY, Volume 53, August 1962, pp. 175-180.

The purpose of this study was to determine if a "set" (or predisposition) to teach for pupil gain influences learning. The experimental and control groups of 14 student teachers each (University of California at Los Angeles) were divided by subject matter specialization (English - 3, American Government and History - 4, and social studies - 7). Five factors were used to match the student teachers individually: teaching major, sex, age, a measure of ability (Cooperative Test Division, 1950), and the public school where student teaching was performed. Students in the experimental group were told that their final grades in a course in educational psychology and student teaching would depend upon the amount of gain which their public school students made in learning the student-teachers' respective teaching fields. Differences between pre-tests and post-tests for 787 secondary school students of English, American Government and History, and social studies indicated that the experimental group of teachers produced more (0.001 level) student gain than did the control group. An analysis of covariance of the post-test scores adjusted for the pre-test scores supported the above result (0.05 level). It was concluded that the concept of "set" finds application in student teaching.

STUDENT PERSONNEL IN TEACHER EDUCATION

ASMON, Robert Vance. "Associative Factors in Changes of Student Teachers' Attitudes During Student Teaching," Unpublished doctoral dissertation, Indiana University, 1959.

The purpose of this study was to determine whether there was a significant change in student teachers' attitudes during student teaching as measured by the Minnesota Teacher Attitude Inventory (MTAI). A total of 222 secondary student teachers were tested with Form A of the MTAI before their student teaching and at the end of student teaching experience. The 20 teachers whose scores increased and the 20 teachers whose scores decreased were interviewed. The t-test showed that the mean MTAI scores for all students showed a loss in mean MTAI points at less than 0.01 level of confidence. By the use of the chi-square a significant difference at the 0.05 level of probability was found in the responses of the students whose MTAI score increased during student teaching concerning the satisfactory-unsatisfactory nature of their student teaching experience.

BECKER, Wilmer Henry. "An Evaluation of the Student Personnel Program at The Auburn University School of Education," Unpublished doctoral dissertation, Auburn University, 1961.

The purpose of this study was to evaluate the student personnel program on the undergraduate level at the Auburn University School of Education. Data for the investigation were obtained from: (1) observations of the student personnel program; (2) interviews with student personnel staff members; (3) questionnaires completed by student and faculty personnel; and (4) pertinent faculty reports. Analysis of the data led to the following conclusions: (1) faculty respondents, in theory, accepted in all or most respects a viewpoint consistent with democratic values for the institution as a whole; (2) the student personnel program was well supported by administrative leadership but was lacking in overall coordination; (3) the student personnel services generally were inadequate in meeting student needs; and (4) faculty generally had a better opinion of student personnel services than did the students.

BIGGERSTAFF, Edwin Levi. "The Relationship of Socioempathic Ability, Self Concept, Sociometric Status and Teaching Effectiveness of Student Teachers", Unpublished doctoral dissertation, North Texas State University, 1963.

The purpose of this study was to investigate the interrelationships among socioempathic ability, sociometric status, self-concept ratings, mental ability, and teaching effectiveness of student teachers and to determine differences existing between sexes, teaching levels, and subject major groups of secondary student teachers. The subjects were 67 elementary and 60 secondary students enrolled in North Texas State University. All student teachers were administered a group ability test, a scale designed to measure six areas of self concept, and a scale designed to measure sociometric status and socioempathic ability. It was found: (1) that self concept ratings are not significantly related to the student teacher's ability to predict his own sociometric status within a peer group; (2) the teaching effectiveness of secondary student teachers was found to be predicted from the self concept test which measures self actualizing tendencies; (3) the experience of student teaching had no effect on socioempathic ability; and (4) the relationship between sociometric status and the ability to predict one's own sociometric status within a peer group was significantly higher for elementary than for secondary teachers.

BROWN, Gertrude. "A Study of Student Needs", TEACHER EDUCATION QUARTERLY, Volume 13, Fall 1955, pp. 42-46.

This was a study designed to determine student concerns, problems, or inadequacies of a personal, social, physical, professional, or academic nature. Entrance data were obtained on all students (N=40) entering elementary education at Danbury State Teachers College for the 1954-55 school year. Instruments used in addition to entrance data were the Allport-Vernon Study of Values Scale, the Watson-Glazer Critical Thinking Appraisal and the Minnesota Teacher Attitude Inventory. A sociogram was also constructed in a beginning psychology course. Group and individual conferences were held with the students. Needs of the students (as evidenced by the instruments) were categorized and submitted to the faculty for additions. Seven additions were made to the list. It was found that student needs fell into seven categories: improvement of peer relationships, independence and recognition from parents, social maturity and responsibility, growth in professional understanding, development of purpose and understanding, competence in basic academic skills,and achieving of pleasing physical appearance.

CAMPBELL, Robert E. and **HORROCKS**, John E. "A Note on Relationships Between Student and Parent Minnesota Teacher Attitude Inventory Scores", **JOURNAL OF EDUCATIONAL PSYCHOLOGY**, Volume 52, August 1961, pp. 199-200.

The purposes of this study were: (1) to determine the similarity in attitudes of students and their parents; (2) ascertain whether students identify with one parent more than another; and (3) to determine the relationship between the attitudes of a student's parents. The Minnesota Teacher Attitude Inventory (MTAI) was administered to 127 Ohio State University College of Education students and their parents. The students were sophomores enrolled in an educational psychology course. The MTAI was administered to the students in a classroom session at the beginning of the course. The MTAI was also mailed to parents of the subjects. It was found that daughters and mothers presented a higher relationship (0.01 level) than did daughters and fathers (0.05 level). Similarly, the son-father correlation (0.01 level) was higher than the son-mother relationship (0.05 level). It was concluded that students tend to identify attitudinally with parents of the same sex.

COLE, David L. "The Prediction of Teaching Performance" **JOURNAL OF EDUCATIONAL RESEARCH**, Volume 54, May 1961, pp. 345-348.

This five-year research was conducted to determine if results from the group form of the MMPI and the group Rorschach for 140 undergraduate students was useful in predicting success in elementary and secondary teaching. These instruments were administered to subjects who were then classified in quintiles according to tentative descriptions derived from prior data from other groups using these same instruments. The researcher observed the subjects twice for the purpose of rating their performance on the Ryans scale. The subjects were divided into subgroups so that they were compared by grade-level-taught and years-of-experience peers. Correlations between instrument scores and conventional selection criteria such as grades, A.C.E. scores, and faculty ratings were made with the observer ratings. Findings indicate that prediction based on the conventional selection criteria was not significantly above chance. By contrast, the personality test materials correlated with the observer ratings with an r of 0.65. The two most useful cues within this material were the quantity and quality of the M scores on the Rorschach, and the FC:CF balance on the same instrument.

COOK, Desmond. "A Further Investigation of Personal Values of Students Entering Teacher Education Programs" **JOURNAL OF TEACHER EDUCATION**, Volume 12, June 1961, pp. 172-178.

This study had as its purpose investigating the personal values held by students enrolled in the teacher education program in a large university. The Personal Value Scale (PVS) devised by

Dilly was administered to 212 students enrolled in educational psychology during the 1958-59 school year. Items were ranked according to frequency of response and compared with results of an earlier study in a smaller institution. It was found that students in the larger institution tended to rank higher statements relative to "security". Other observations are: (1) a high ranking given to "pride" by agriculture students; (2) all statements pertaining to teacher success were placed in the middle of the continuum; (3) marriage was found to be more important to females than to males.

CUMMINGS, Ralph Robert. "An Analysis of Certain Selected Factors Characteristic of Students Who Succeeded in Teacher Education at Ball State Teachers College" Unpublished doctoral dissertation, Indiana University, 1956.

The purpose of this study was to determine whether the characteristics of students ranking highest in the criteria of success are significantly different from the characteristics of students ranking lowest. The population was a selected group of students in the secondary education curriculum who succeeded in completing teacher education and graduated from a teachers college (they were divided into two groups--upper and lower). The measured criteria of success were academic achievement, peer-social acceptance, self-adjustment and critic teacher rating. The chi-square and t-test were used to analyze the data for differences between the two groups. It was found that the success criteria did not appear to distinguish clearly between the upper and lower 27 percent of the distribution. Those in the most successful group, as rated by critic teachers, were not distinguished from the least successful group by their methods courses grades, English proficienty scores, or self-adjustment ratings.

DEL POPOLO, Joseph A. "Authoritarian Trends in Personality as Related to Attitudinal and Behavior Traits of Student Teachers" JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, March 1960, pp. 252-257.

The purpose of this research was to investigate the relationship between an individual's authoritarian personality structure and his opinions and attitudes toward pupil-teacher relationships and his observable classroom behavior. A test of authoritarianisms was adapted from Webster, Sanford, and Freedman. Form A of the Minnesota Teacher Attitudes Inventory measured the attitudes toward pupil-teacher relationships. An Observation Check Sheet for recording the classroom behavioral traits of the subjects was conducted by the author. The procedure employed a pilot group, an experimental group, and a control group; 366 students in all. All subjects were pretested on the Authoritarianism Test and the MTAI at the beginning of the sophomore year and post-tested at the end of the junior year. The Observation Check List was completed during student teaching. Correlations were computed and the following conclusions drawn:

(1) data support the hypothesis that a significant relationship exists between an individual's personality structure and his opinions and attitudes toward pupil-teacher relationships and his observable classroom behavioral traits; (2) authoritarian students tend to get significantly lower scores than equalitarian students on an inventory of attitudes about pupil-teacher relationships; (3) authoritarian students tend to display behavioral traits during student teaching which imply an inability to establish harmonious pupil-teacher relationships. Equalitarian students display traits conducive to the establishment of harmonious pupil-teacher relationships.

DREYER, Albert S. and HAUPT, Dorothy. "The Assertion of Authority: Differences Between Teachers, Student-Teachers, and Mothers of Young Children", JOURNAL OF EDUCATIONAL RESEARCH, Volume 54, October 1960, pp. 63-66.

In order to determine the differences in their assertions of power over children, a set of five story completion situations, depicting adult-child interactions, was presented to 38 mothers of nursery school children, 11 nursery school teachers, 9 nursery school student teachers and 7 kindergarten teachers. Each was asked to respond to the situation described. Each story was scored for the degree of power assertion expressed, and a mean score was obtained for each person. The Kruskal-Wallis H test, a non-parametric analysis of variance, was calculated for the four groups. Analysis of the data indicated that the groups differed significantly in the mean power assertion expressed. The student teachers differed significantly from the experienced teachers and the mothers in that they were not only less power assertive, but were more homogeneous than the other groups. They were most inclined to allow the child choice, and the least inclined to assert authority. The experienced teachers and mothers did not differ significantly from each other. The authors suggested that an intensive analysis of facets of the teacher's role with a view to seeing how role demands and personality needs are congruent and lead to satisfactions from teaching would be of value.

DUTTON, Wilbur H. "Attitude Change of Elementary School Student Teachers and Anxiety" JOURNAL OF EDUCATIONAL RESEARCH, Volume 55, May 1962, pp. 380-382.

This study was focused upon three hypotheses: (1) student teachers possessing strong anxieties may be expected to change their attitudes in the direction of their supervising teacher's attitude; (2) highly anxious student teachers will perceive their pupils negatively and their supervising teacher as negative toward children; (3) student teachers, whose initial attitude scores are lower than those of the supervising teacher, will change in a more positive direction. The Minnesota Teacher Attitude Inventory (MTAI) was administered to 91 student teachers at the beginning and conclusion of their student teaching semester. The Taylor Manifest Anxiety Scale and the Anxiety Differential were used to secure anxiety scores. Supervising teachers completed the MTAI, and student teachers completed an MTAI in the way in which they believed their supervising teacher would respond. The findings include the following: (1) the over-all magnitude of change was not significantly greater between students who were highly anxious and those who were non-anxious; (2) both highly anxious and non-anxious student teachers changed their attitudes toward youth significantly in a negative direction--and in the direction of supervising teachers regardless of initial scores; (3) comparable students not enrolled in student teaching maintained high positive scores toward pupils.

EDSON, William H. and WILK, Roger E. AN EXPERIMENTAL STUDY OF THE ADMISSIONS INTERVIEW IN TEACHER EDUCATION FOR PREDICTING SUCCESS IN TEACHING, Washington: U. S. Government Printing Office, 1958.

This study was designed to seek answers to the three following questions: (1) What is the influence of interview content on judgments and predictions concerning students seeking admission? (2) What is the influence of the counselor himself on these same judgments and predictions? (3) What is the contribution of the interview to predictions of persistence in teacher education? Subjects chosen were majors in elementary and nursery-kindergarten-primary education at the College of Education, University of Minnesota. One hundred sixty-seven students were chosen from the two curriculums mentioned. Approximately one-fourth or forty-one were nursery-kindergarten-primary majors, the remainder in elementary education. Prior to making an appointment, each subject was required to complete four psychological tests, speech and hearing tests and a health examination. The four tests included the Miller Analogies Test, Form A; the Cooperative Reading Comprehension Test, Form C 2 R; the Minnesota Teacher Attitude Inventory (MTAI); and the Minnesota Multiphasic Personality Inventory (MMPI). High school rank (HSR) and the Cooperative English Test, Form Z were also used. Each subject was assigned for three structured interviews--one which dealt with perceptions of self, a second with perception of children, and a third with perceptions of teachers. Each of the interviews, conducted by trained counselors, contained sections concerned with achievement and with problems of interpersonal relations. At the conclusion of each interview the counselor rated the subject on each of five behavior variables. These variables are as follows: Achievement Potential (Ach p), Need Achievement (n Ach), Need Dominance (n Dom), Need Integration (n Intg), and Press Security (p Sec). In addition to rating each subject, the counselor also responded to the following questions: "Do you think this student will graduate from college?" and "Do you think that this student will enter teaching?" On a three-point scale, "very certain", "somewhat certain", and "not at all certain", the counselor indicated how sure he was of his prediction in each instance. The five behavior variables were analyzed by a two-way analysis of variance. It was found that no significant difference existed among the mean ratings of these variables, except for Need Dominance. A study of the intercorrelations between judgments of these variables made on the three different bases, interview only, test data only, and interview plus test data, showed that counselors depend on the interview to assess the latter three variables but they depend on test and achievement data for judgments concerning the two achievement variables.

EUSTICE, David Edward. "The Relationship of the Non-Academic Pre-Service Experiences of Teachers and Teaching Success", Doctoral Dissertation, University of Wisconsin, 1962.

The purpose of this study was to determine how subjects in contrasting teaching success groups differ in socio-economic backgrounds. Background information was collected for 109 University of Wisconsin education students in a structured questionnaire. Teaching success ratings were obtained from supervisory personnel using an adaptation of Barr's teacher rating blank. Backgrounds and experiences of the success groups were compared. The data were tabulated in two-way contingency tables, and their relationships tested by chi-square. The subjects were divided into lower and higher success groups. It was found that the higher success group had less favorable backgrounds according to the criteria used (parents' education, parents' occupational level, etc.) than did the lower success group.

FOSS, Maurice F. "Placement Bureau Data and Teaching Success" JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, March 1960, pp. 276-278.

This study is an attempt to relate the data in placement folders of prospective teaching candidates with subsequent teaching performance. The sample included 33 industrial arts teachers. The five types of placement bureau data examined were: (1) college instructor ratings; (2) student teaching reports; (3) student statements of teaching philosophy; (4) general letters of reference from faculty members, and (5) transcripts of courses and grades. On the basis of their teaching performances judged by employing officials, the teachers were divided into 3 groups; superior, satisfactory and least satisfactory. In contrasting the data for the most and least successful groups, it was found that: (1) instructor ratings failed to indicate a difference between the groups; (2) student teaching reports with comments such as "creates enthusiasm and interest" did differentiate between good and poor teachers; (3) philosophies mentioning interest in society and children generally identified good teachers, while those mentioning money and prestige generally indicated poor teachers; (4) general reference mention of industriousness and scholastic success differentiated superior from poor teachers, but the mention of character and appearance traits did not; (5) superior teachers made slightly better quality-point averages than did less satisfactory teachers.

FOX, Raymond B. "Factors Influencing the Career Choice" JOURNAL OF TEACHER EDUCATION, Volume 12, December 1961, pp. 427-432.

The purpose of this study was to determine those factors which influence the career choice of prospective teachers. A questionnaire consisting of 25 most frequently mentioned factors which prospective teachers listed in their autobiographies as influencing them in their selection of teaching as a career was devised. The questionnaire was completed by 173 prospective teachers in four junior classes in elementary education and secondary education at Northern Illinois University. The factors were ranked according to the degree of influence which each factor had. The two factors respondents reported as influencing them most were the desire to work with children and the desire to impart knowledge. Other factors were concerned with job security, long summer vacations, short school day, etc. A comparison of the responses of men and women showed statistically significant differences (0.05 level) in relation to seven factors. They were: desire to work with children, desire to be of service to society, liking for a particular subject, experience with youngsters, short school day, salaries for teachers, results of vocational interest tests, teaching as a stepping stone, membership in FTA. It was concluded that recruitment practices should be aimed at persons' altruistic and practical natures.

FRIDIAN, Sister M. A STUDY OF CHARACTERISTICS OF PROSPECTIVE TEACHERS BY MEANS OF A SELF-RATING SCALE, Fort Wayne, Indiana: Saint Francis College, 1961.

This was a study of major characteristics of effective teachers. The investigator in cooperation of 182 teacher-education students agreed upon ten personality factors contributing to teaching success. These factors were then placed on a scale of values from one to four and the students were asked to rate themselves on the degree to which they possessed the traits selected. The scale was administered to freshmen, sophomores, juniors, and seniors. It was found that a trend existed in the direction of higher trait-ratings by students as they progress through college. The ten traits were as follows: Intelligence, Social Intelligence, Academic Achievement, Character, Personality, Communication, Motives for Teaching, Physical Appearance, Sense of Responsibility, and Success in Previous Experiences with Children.

GEDDES, Alfred. "Student Appraisal of College Personnel Services", TEACHER EDUCATION QUARTERLY, Volume 14, Fall 1956, pp. 12-13.

The purpose of this study was to determine the effectiveness of certain services of the student personnel program at Danbury State Teachers College. A total of 200 elementary education students were asked to complete a questionnaire. For each item space was provided for a positive or negative reaction of student's understanding of the purpose of the service. Space was also made available for registering responses relative to awareness of the service on campus. The first figure listed will be concerned with those persons who understood the nature of the service, the second with those who were aware of the service. Housing, 98.6 - 97.6; orientation, 98.5 - 94; student activities program, 95.5 - 87; counseling, 96.3 - 90; Health Services, 88 - 73; Financial Aid, 65.5 - 53.5; Pre-College Guidance, 55.6- 49.4; Constructive Discipline, 48 - 58.6; and Religious Life, 10.5 - 4. It was concluded that the data as listed could well be used to modify the existing program.

GIOSTI, Joseph P. "Prediction of Academic Success in a College of Education Based on High School Curriculum Experiences", Unpublished doctoral dissertation, Pennsylvania State University, 1963.

This study was designed to investigate the relative importance of curriculum experiences in high school for prediction of academic success in the College of Education at Pennsylvania State University. The high school records used in this study were those of 397 students who were admitted to the College of Education, on a regular basis, in September 1960. It was found that grades earned in high school English were a better predictor of grades earned in college than five other subject matter variables.

GOODMAN, Michael. "An Evaluative Survey of the Student Personnel Program at the New Jersey State Teachers College at Montclair, 1908-1954", Unpublished doctoral dissertation, New York University, [illegible]57.

The purpose of this study was to evaluate the effectiveness of the student personnel program at Montclair State Teachers College. Historical background was obtained by collecting and collating pertinent information from various sources. This data were compiled in chronological order. Faculty members were asked to complete questionnaires and students were asked to complete a questionnaire and the Mooney Problem Checklist (MPC). It was found that two-thirds of the administrative staff members felt that the personal services were adequate; student reaction revealed that new student orientation, housing, extra-class activities, adjustment of programs to student needs, and placement were adequate; most students were concerned about the curriculum and financial problems as evidenced by the MPC.

GRAY, Maxine. "The Use of the Minnesota Teacher Attitude Inventory in Selection, Counseling and Placement of Student Teachers", Unpublished doctoral dissertation, Wayne University, 1956.

The purpose of this study was to evaluate the effectiveness of the MTAI as an additional procedure in the selection, placement, and counseling of students beginning their student teaching experience. One hundred twenty-one second semester students in the Department of

Elementary Education at Wayne University were involved at the beginning of the study. By the end of the semester, 114 remained. Results of the inventory administered to the students, information compiled from admissions applications, and the Evaluation Form for Reporting Student Progress in student teaching served as sources of data for this study. Correlations between scores on the inventory, honor point average, grade in student teaching, and ratings on the American Council on Education Psychological Examination for College Freshmen were made. A multiple correlation was also determined using the above mentioned variables. It was found that no predictive correlation existed between the MTAI and any of the other instruments used. It was concluded that no one method is adequate to be used as a basis for predicting student teaching success.

GROFF, Patrick. "The Personality Self-Images of Student Teachers," JOURNAL OF TEACHER EDUCATION, Volume 12, December 1961, pp. 433-436.

The purpose of this study was to compare student teachers' estimates of their own personality self-images with student teacher supervisors' estimates of student self-images. The data for the study were gathered from 317 elementary teacher education students at San Diego State College. Students were asked to rate themselves on 26 personality characteristics compiled by the investigator. The students' ratings were then compared with opinions of their student teaching supervisors on the same instruments. It was found that a large percentage of student teachers in this study believed they possessed certain "positive" personality characteristics, e.g., poise, conscientiousness, tolerance, and cheerfulness. Very few believed they possessed negative characteristics. College supervisors agreed that these student teachers' self-judgments of certain personality characteristics were 56.9 percent correct. It was concluded that the results of this study suggest a more refined instrument to determine student teacher personality characteristics.

HANBRICH, Vernon F. "The Motives of Prospective Teachers," JOURNAL OF TEACHER EDUCATION, Volume 11, September 1960, pp. 381-386.

The purpose of this study was to determine the reasons why students enroll in the College of Education at the University of Utah. A questionnaire was sent to 131 secondary education and 64 special and elementary prospective teachers. It was found that "security" constituted 30 percent of the reasons for entering the field of teaching and "liking children" was of importance to another third. One other dominating reason (29 percent) was "evidence of professional standing." "Short hours" and "long vacations" were reasons which were also listed. Forty-five percent of the students reported making up their minds to teach before coming to college, and another 37 percent made the decision before their junior year in college.

HATFIELD, Agnes B. "An Experimental Study of the Self-Concept of Student Teachers," JOURNAL OF EDUCATIONAL RESEARCH, Volume 55, October 1961, pp. 87-89.

This study was designed to measure the concept which a student teacher has of himself as a member of a social group and to determine the relationship between his self-concept and successful performance in student teaching. Inferior and superior elementary student teacher groups were selected by averaging the teaching performance ratings given by two cooperating teachers and two college supervisors. A Q-sort of social behavior items was used to assess the way the student teacher perceived himself and also the way he describes the person he would like to be. A coefficient of correlation between the self sort and the ideal sort was determined. The means of the correlations between the two sorts for the two experimental groups (Z scores) were found to be significantly different, in accordance with the researcher's expectations that a significant and positive relationship exists between a student's self-valuations and his success in student teaching. It was concluded that the early identification of prospective student teachers harboring serious doubts about themselves and the provision of adequate counseling services might influence the quality of teachers produced. This is supported by the finding that the ideal descriptions of the two groups studied were virtually identical, but that a wide divergence was found in self-descriptions.

HEIL, Louis M. MODIFYING BEHAVIOR (SELF-CONCEPT) OF CERTAIN PROSPECTIVE TEACHERS, Washington: U. S. Government Printing Office, 1962.

The purpose of the study was to explore more deeply into the meaning of elementary school teacher effectiveness, particularly the significance of teacher personality, and to make recommendations based on the findings resulting from its work. Psychological reports on 23 prospective elementary teachers were taken at the end of their freshman year and classification summaries were made by a psychologist. The incidence and stability of the various personality types among elementary education majors at Brooklyn College were investigated by means of the Manifold Interest Schedule (MIS). It was found that: (1) personality characteristics of freshman students planning to become teachers were quite similar to those of in-service teachers when the students are similarly classified on the basis of the MIS; and (2) the proportion of students, who, on the basis of their classifications on the MIS, are potentially ineffective teachers is relatively high.

HILL, Robert E., Jr. "Dichotomous Prediction of Student Teaching Excellence Employing Selected CPI Scales," JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, May 1960, pp. 349-351.

This study was undertaken to see whether selected psychological traits as measured by the California Psychological Inventory could be used effectively in predicting student teacher excellence. The Inventory was administered to 204 student teachers of both sexes who had been designated by their supervisors as group A, better student teachers, and group B, poorer student teachers. Three CPI scales were used in the analysis: dominance, achievement via conformance, and psychological-mindedness. The data were first treated individually for each scale, using the traditional 2 (CR) approach. The significance of the differences between means was tested by the usual formula. Next the discriminatory analysis procedure was employed. The data were then treated by a regression analysis of variance. The following conclusions were drawn: (1) the discriminant function (although significant at the 0.05 level) is not sufficiently accurate in its prediction to warrant its use, since mis-classifications may be expected between 40 percent and 45 percent of the time; (2) the dominance trait as measured on the CPI is not significant at the 0.05 level; (3) the psychological-mindedness trait is not significant at the 0.05 level; (4) the CPI scale which alleges to measure achievement via conformance is significant at the 0.05 level.

HILLS, John R. and DOWNS, Harry S. "College Students' Attitudes Toward Teaching As a Profession," THE JOURNAL OF TEACHER EDUCATION, Volume 13, December 1962.

The main purpose of this study was to determine reasons why teaching was not attracting the best student. A questionnaire was sent to 2,241 upper division male students at a southwestern state university during the winter quarter of 1961. The students were enrolled in the colleges of Arts and Sciences, Law, Pharmacy, Agriculture, Forestry, Education, Business Administration, Journalism, and Veterinary Medicine. The study showed that financial rewards and the possibility of advancement in the public school teaching profession are main factors in the failure of highly capable young men to enter the teaching profession. The author suggested that higher salaries should be offered to the most able teachers entering secondary education teaching with lesser salaries being paid the average teacher.

JANTZEN, J. Marc. "An Opinionaire on Why College Students Choose to Teach," JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, September 1959, pp. 13-17.

This study compares the results of three investigations to see if differences or similarities exist during a ten-year span in the opinions expressed by college students on why they had chosen to enter the teaching profession. A checklist of 16 statements of factors which might have influenced college students to choose teaching as a profession was administered to 177 men and 108 women students initially, to 240 men and 227 women students two years later, and to 103 men and 123 women students 10 years after the initial testing. These students, enrolled in teacher education courses, were asked to check all of the statements that might have influenced them in their choice of becoming teachers. A chi-square test indicated a significant difference in the ratios of men and women and the necessity for treating the data from the sexes separately. Percentages of each group checking each item by year were determined, and statistical significance was tested. The findings included: (1) college students who plan to teach maintain over a ten-year period that their number one reason is an interest in children and young people; (2) college students also rate high the assurance of an adequate income and the possibility of continuing their intellectual growth; (3) having a summer for study, travel, and vacations is ranked important, but less so in 1956 than in 1946 and 1948; (4) many teachers showing enthusiasm on the job have influenced young people later to choose to become teachers; (5) significant shifts in opinions on why they had chosen to become teachers are indicated for women in checking more often the lifelong opportunity to learn; for both men and women in checking more often the enthusiasm of a former teacher; for women the possible service to mankind; and for men a retirement system is an increased influence; (6) women make their choice to become teachers at an earlier age than do men. More than half of the women had reached this decision in high school, while only one fourth of the men indicated doing so.

JOYCE, Bruce. "An Orientation Toward Values in Teacher Education," JOURNAL OF TEACHER EDUCATION, Volume 12, December 1961, pp. 463-465.

This study was designed to explore the educational beliefs of students at various stages of the teacher education program. The instrument used in the study was A Scale for Determining Teacher Beliefs (SDTB). The SDTB is designed to determine whether a teacher is more "progressive", "community centered" or "academic". The sample included (1) sophomores who had indicated education as an intended major, (2) juniors who were completing one semester of study at the College of Education, (3) seniors who had completed two or three semesters of student teaching and nearly all of their course work in education. It was found that the average scores for the three groups were almost identical, suggesting that the educational beliefs of the students were similar. Sophomores, juniors and seniors also were about equally inconsistent in their responses regarding their beliefs.

KROPP, Russell P. and ANDERSON, John E., Jr. "Teacher Roles Before and After Internship," JOURNAL OF EDUCATIONAL RESEARCH, Volume 56, March 1963, pp. 366-369.

This study deals with interns' (student teachers') conceptions of the ideal and actual roles of the teacher, changes in such perceived roles over the internship period, and the relationships between such roles as perceived by interns and the conceptions of such roles held by public school directing teacher and the college methods teacher. Data were obtained by having nine secondary student teachers, the directing teachers, and the methods teacher rate 30 statements describing teachers' roles. Correlations between sets of sorts were determined by Q-sort technique and the average correlation, according to the Fisher Z-transformation, was used as the descriptive statistic. It was found that: (1) there was a high relationship between the beginning and end of semester ideal sorts of interns; (2) following student teaching the subjects' conceptions of their actual role were much like their conceptions of the ideal role; (3) students' actual sorts were only moderately correlated with the sorts of their directing teachers and less so with that of their methods teacher; (4) students predicted both the ideal and actual sort of the directing teacher better than the sorts of the methods teacher.

KRUMBOLTZ, Helen B. "Birth Rank and Family Size: Relationship to Certain Qualifications of Prospective Teachers," JOURNAL OF TEACHER EDUCATION, Volume 9, June 1958, pp. 171-178.

The purpose of this study was to determine if a prospective teacher holds more favorable attitudes toward children if he is the oldest child in his family, if he comes from a large family, or if the prospective teacher is male or female. The sample consisted of college juniors enrolled in the Minnesota College of Education during the spring quarter, 1955. Of the total 426 students, 290 were females and 136 males. The elementary curriculum enrolled 38.5 percent; the secondary and special education curricula enrolled 40.9 and 20.6 percent respectively. The Minnesota Teacher Attitude Inventory (MTAI), rank in high school (HSR), and the American Council on Education Psychological Examination (ACE) were used. Scores from the ACE and HSR were converted to T-scores with a theoretical mean of fifty. A two-way analysis of variance was utilized to test statistical significance of any differences in mean scores among the categories of each independent variable of the criterion measures (birth rank, family size, and sex). The assumption of homogeneity of variance within cells was tested using the L1 test. It was found that the oldest children of a family group, both male and female, score highest on the MTAI, although the differences in birth rank do not reach statistical significance. Differences between the sexes are significant at the 0.01 level, with females scoring higher on the MTAI. Analysis of variance of the ACE standard scores indicate that no significant differences exist among birth ranks, family size, or between sexes. Females rank significantly higher than males in high school grades (0.01 level). A significant difference among birth ranks is also found at the 0.01 level. It was concluded that scholastic aptitude as measured by the ACE is equally divided among birth ranks and family sizes as well as between the two sexes, and it is the child without brothers and sisters who makes the most outstanding achievement record in high school.

LANG, Gerhard. "An Experimental Scale to Measure Motives for Teaching," JOURNAL OF EDUCATIONAL RESEARCH, Volume 51, March 1958, pp. 687-693.

The experimental scale discussed in this paper was constructed in order to obtain a quantifiable measure of overt motivations for teaching (reasons verbalized by subjects) which (1) would take into account the factors of the relative social acceptability of the stated reason and which (2) could be related to other variables such as measures of covert motivations (personality needs), teaching effectiveness, and satisfaction with teaching. The investigator assembled 76 reasons which may influence a woman to select teaching as a profession as they appear in other literature and research. (Ex. "I like to help develop our future citizens," "I enjoy feeling superior to others.") A Q-sort by 60 judges ranked these reasons according to "social acceptability to the majority of people". For the scale, 25 reasons were selected on the basis of their rank placement at specified intervals along the continuum of social acceptability and their relatively small interquartile deviation. Respondents were asked to indicate the three responses "most" influential in their decision and the three "least" influential; five reasons each were marked "slightly" and "much", and the nine remaining reasons "half/half". A weighted scoring results in an index of overt motivations denoting the extent to which a subject admits the influence of reasons varying in degrees of social acceptability for entering the teaching profession. The author views this scale as a research, teaching, and counseling tool.

LANG, Gerhard. "Motives in Selecting Elementary and Secondary School Teaching", JOURNAL OF EXPERIMENTAL EDUCATION, Volume 29, September 1960, pp. 101-103.

The purpose of this study was to determine what motives exist for choosing the teaching profession. The subjects of this study were 101 female elementary and 87 female secondary teachers, 21-29 years of age, and currently teaching in 16 New York City Public Schools. The Long Scale of Motives for Teaching and the Edwards Personal Preference Schedule were the instruments used in the study. The subjects were asked to complete a brief background questionnaire and then to consider the degree to which each of 25 reasons had influenced their choice of teaching as a profession. It was found that both elementary and secondary school teachers rated as most influential reasons which are socially acceptable; they rated as least influential reasons which are socially unacceptable. All rank difference correlations obtained between social acceptability values of the reasons and frequency of checkings by subjects in the two response categories were significant at better than the 0.001 level.

LUCIO, William H. and WENGER, M. A. PREDICTION OF TEACHER PERFORMANCE AND EMOTIONAL STABILITY: A PSYCHOPHYSIOLOGICAL PILOT STUDY OF FEMALE STUDENT TEACHERS Washington: U. S. Government Printing Office, 1961.

The purpose of this study was to investigate, in a young adult female population, functions innervated by the autonomic nervous system (ANS). Prior to student teaching 279 female students enrolled in elementary teacher education were engaged in a required test program which involved a series of psychological and physiological tests designed primarily to assay functioning of the autonomic systems of the nervous system. Later, at the end of sixteen weeks of student teaching, assessment of classroom teaching performance for 217 subjects were obtained through the use of two instruments: (1) the Classroom Observation Record developed by Ryans and (2) the University of California Rating Scale. University supervisors and outside observers trained in the use of the rating instruments conducted observations of student teaching. The first step in the analysis involved inspection of the distributions of the physiological data for non-normality, and the application of appropriate transformation to reduce skewness and to effect homogeneity of variance. The corrected data then were submitted to factorial analysis to test the thesis that an autonomic factor existed among the young adult women comparable to that previously reported for children and young adults. Equations were derived for estimating the factors obtained from the population and factor estimates were computed. All physiological and psychological data were correlated with various indices of student teacher performance. It was found that: (1) scores in the Guilford-Zimmerman Scale S were positively related to teaching performance; (2) characteristic level of muscular tension was negatively related to teaching performance; and (3) finger temperature was positively related to teaching performance. It was concluded that a good student teacher can thus be characterized as relaxed, sociable, and possessing high finger temperature.

MAGEE, Robert M. "Admission-Retention in Teacher Education" JOURNAL OF TEACHER EDUCATION, Volume 12, March 1961, pp. 81-85.

The purpose of this study was to secure information concerning types of post admission formal screening devices in use, with particular reference to minimum scholastic standards required for admission and/or retention in the professional teacher education program. In July, 1959, a questionnaire was sent to 236 publicly supported institutions. There was a return of 180 usable responses. It was found that: (1) 92 percent of the institutions impose some official hurdle at the upper-division level which prospective teachers must clear; (2) the most common screening device was formal acceptance for student teaching (81.8 percent); (3) only 3.3 percent of the institutions reporting required a scholarship average of 2.50 as a minimum for retention.

MERRILL, Reed M. "Comparison of Education Students, Successful Science Teachers and Educational Administrators on the Edwards PPS" JOURNAL OF EDUCATIONAL RESEARCH, Volume 54, September 1960, pp. 38-40.

The purpose of this research was to compare several teacher groups on the Edwards Personal Preference Schedule (EPPS) which is designed to measure the relative strength of 15 personality needs. The groups compared were: (1) 781 male freshmen and sophomore education students; (2) 53 successful male teachers enrolled in an NSF Academic-Year Institute; and (3) 32 school administrators involved in an in-service training program. The data were treated by ascertaining the significance of the differences in the means of the tested groups. Needs found to be most characteristic of successful teachers and administrators were high deference, order, and endurance and low heterosexuality and exhibition. Marked variations from this pattern were found for education students. The pattern for successful teachers emerges as a "meek" need structure with a strong "marketing orientation".

MURPHY, Mary O. "A Study of Graduates of the University of Georgia Who Are Certified to Teach With Respect to Entrance Into the Teaching Profession", Unpublished doctoral dissertation, University of Georgia, 1960.

The purpose of this study was to compare graduates who entered the teaching profession with graduates who did not. The sample for the study were 462 graduates, 138 of whom did not go into teaching and 324 who did make teaching their profession. Sources of data were "application for admission" forms and permanent record cards made available at the Guidance Center of the University. Personal background, high school and college performance and placement scores were used as variables for the comparison. It was found that persons entering into the profession were younger (0.05 level); the years spent in pursuing the bachelors degree was less for entries (0.01 level); and a significantly higher percentage of entries graduated with the B.Sc. in Education than did non-entries (0.001 level).

MYERS, Roger A. "Faculty Perceptions of Student Success in Teacher Education", JOURNAL OF EDUCATIONAL PSYCHOLOGY, Volume 51, August 1960, pp. 235-238.

Fifty members of a department of education faculty described the behavior of good and poor students in a teacher education program using a check list of 169 descriptive statements. A Wherry-Winer factor analysis of these statements resulted in the extraction of four factors which were assumed to represent dimensions of student behavior as perceived by faculty members. The factors were: General Acceptability, Readiness to Learn, Social Sensitivity, and Impulse Control. It was concluded that further study would lead to the development of ways of evaluating students on these dimensions for the purpose of arriving at a multiple criterion of success.

NAVARRA, John J. and DUGAN, Roberta R. "A Pilot Study to Determine the Relative Importance of Selected Personal and Professional Factors in The Success of The Student Teacher in Science", THE JOURNAL OF EXPERIMENTAL EDUCATION, Volume 31, Summer 1963, pp. 413-418.

This investigation was designed to make a study of selected personal and professional factors in the background of nineteen senior science majors at the New Jersey State College in an effort to explore possible factors predictive of success in science teaching. The selection of the personal and professional factors studied was based on the following criteria: college scholastic record, I.Q., National Teachers Examination score, professional viewpoints, reasons for vocational choice, teacher attitudes, and high service goals. Factors of the above categories were submitted to statistical correlation and tests of significance were made. It was found that the data show agreement between science faculty and peer judgments as to student rank according to potential effectiveness as a science teacher. A significant correlation was found to exist between high scores in the professional viewpoints area and high egocentricity scores. A relationship (insignificant) existed between I.Q. scores and multidimensional appraisal of effectiveness when judgments of supervisors, faculty, and students were combined with college scholastic averages and National Teachers Examination Scores.

OLANDER, Herbert and KLEYKE, Helen M. "Differences in Personal and Professional Characteristics of a Selected Group of Elementary Teachers with Contrasting Success Records," EDUCATIONAL ADMINISTRATION AND SUPERVISION, Volume 45, March 1959, pp. 191-197.

The purpose of the study was to discover whether certain personal, social, or professional characteristics of good and poor candidates for teaching could be determined. A sample of 108 graduates of Duquesne University were used. Determining traits were observed during the senior year of college and the teachers were divided into good and poor teacher groups. By use of the t-test, significant differences were found in adaptability, resourcefulness, and emotional security. The best predictive measures were found to be: (1) data relating to emotional maturity; (2) the National Teacher Examination; (3) The Purdue English Test; and (4) the student's quality point average at the university. Findings based on pre-service data showed that the grade in student teaching was not a discriminating factor.

PECK, Robert F. "Personality Patterns of Prospective Teachers," JOURNAL OF EXPERIMENTAL EDUCATION, Volume 29, December 1960, pp. 169-175.

The purpose of this study was to determine if a discernible personality pattern exists among prospective teachers. A sentence completion instrument designed for use with college students, (Peck Sentence Completion, Form 2-B) was administered to a random sample of 69 junior and senior women majoring in elementary education at the University of Texas and at a state teachers college. The subjects were rated on a nine point scale according to Teaching Potential (TP). Scores on the TP scale were then correlated with scores on four other personality measures. These were: the Lefkowitz Rigidity Scale, the Worchel Self-Activity Inventory, the McCandles Anxiety Scale, and a Mental Health Q-sort. It was found that the correlations of the Teaching Potential ratings with other instruments are as follows: Rigidity Scale, -0.42 (0.01 level); Self-Anxiety Inventory -0.20; McCandles Anxiety Scale, 0.05; Mental Health Q-sort maturity score, 0.28 (0.05 level).

RICCIO, Anthony C. "When Do They Decide to Teach?" PEABODY JOURNAL OF EDUCATION, Volume 39, September 1961, pp. 94-95.

This study was designed to determine the age at which prospective teachers decide to become teachers. The subjects were 488 students (365 women and 123 men) enrolled in a first course in education at The Ohio State University. It was found that the age of decision ranged from 5 to 40 years of age for women and from 10 to 28 years of age for men, with the mean age of decision being 15.08 years and 17.5 years respectively. It was suggested that attention be given to recruiting girls in the junior and senior high school years and boys in the later high school and early college years.

RICCIO, Anthony and PETERS, Herman J. "The Study of Values and the Minnesota Teacher Attitude Inventory," EDUCATIONAL RESEARCH BULLETIN, Volume 39, March 1960, pp. 101-103.

The purpose of this study was to determine what relation exists between the study of Values (SV) and the Minnesota Teacher Attitude Inventory (MTAI). Subjects for this study were 488 students enrolled in the first course in education at The Ohio State University in 1958-59. Product-moment correlations were found for the MTAI and individual scales of the S-V. A test of significance of data was used to determine any significant differences in comparing the variances of the MTAI of men and women in terms of their dominant value patterns. It was found that only two of six scales of the SV correlated significantly (0.01 level) with the MTAI--aesthetic and political. No significane differences were found between men and women on the subtests of the SV and MTAI.

RICHARDS, Rachel. "Prospective Student's Attitudes Toward Teaching," JOURNAL OF TEACHER EDUCATION, Volume 11, September 1960, pp. 375-380.

This was a study designed to investigate the motivating factors in the choice of teaching as a career. An attitude inventory was administered to 530 new students in the College of Education at The Ohio State University. The inventory was of the True-False type and contained 50 statements. It was found that over 80 percent of the students felt teaching was a good career choice for various reasons. Eighty-seven percent felt teachers work longer hours, 66 percent felt the profession does not offer much advancement, and 62 percent felt that the community would place restrictions upon their personal lives. Sixty-five percent expected to receive a salary of six thousand dollars within 10 years. Forty-four percent felt graduates of other colleges should not be able to teach without some professional education.

SASSENRATH, Tulivo and FATTU, Nicholas A. "Relationship Among Factors Obtained for Elementary and Secondary Student Teachers" Bulletin of the School of Education, Indiana University, Volume 39, September 1963.

The purpose of this study was to determine, from within a battery of 47 predictor and criterion variables, the factors or dimensions of behavior for a group of elementary and a group of secondary student teachers and to relate the two sets of factors. It was predicted that the following eight factors would be related for the elementary and secondary student teachers: verbal facility, number, thinking, teacher effectiveness, scientific, literary-artistic, parental education, and social science. A separate centroid factor analysis was conducted on a correlation matrix of 47 variables for elementary and secondary teachers. Twelve factors were extracted for the secondary group. Both sets of factors were rotated analytically by the Varinax method, and then two sets of factors were related.

The following eight factors were tentatively identified and appeared to be related for elementary and secondary teachers: verbal facility, teaching effectiveness, critical thinking, inferential thinking, parental education, number, computational preference, aesthetic preference, and routine outdoor preference. The following four factors were tentatively identified for the elementary student teachers but did not appear to be related to any of the factors for the secondary student teachers: literary achievement, scientific, accurate thinking, and realism. A status and a cultural factor were tentatively identified for the secondary student teachers which did not appear to relate to any of the factors for the elementary student teachers.

SCANDRETTE, Onas. "Differential Need Patterns of Women Elementary and Secondary Level Student Teachers," JOURNAL OF EDUCATIONAL RESEARCH, Volume 55, May 1962, pp. 376-379.

The purpose of the study was to determine whether scores on the various need variables of the Edwards Personal Preference Schedule (EPPS) would statistically discriminate between: (a) students preparing for teaching at the elementary level and the EPPS liberal arts norm group; (b) students preparing for teaching at the secondary level and the norm group; and (c) students preparing for teaching on the elementary level and students preparing to teach at the secondary level. Mean scores for each of the fifteen "needs" purportedly measured by EPPS were computed for both elementary and secondary groups and the "t" ratio was used to test the significance of the difference. Statistically significant differences between the mean scores of elementary and secondary student teachers were found for autonomy, affiliation, dominance, and aggression. Generally speaking, the need patterns of students preparing to teach on the secondary level were more similar to EPPS's liberal arts norm group than was true of students preparing to teach on the elementary level. The author concludes that if these need patterns are significantly related to successful teaching, the EPPS may prove to be a useful instrument for screening and counseling.

STAFFORD, Kenneth R. "The Minnesota Teacher Attitude Inventory Scores of Negro and White Fifth Year Students in the Arkansas Experiment in Teacher Education," JOURNAL OF EDUCATIONAL RESEARCH, Volume 51, April 1958, pp. 633-634.

The purpose of this study was to determine whether there was a difference between the MTAI scores of Negro and white student groups involved in the experiment. The Negro (N=15) and white (N=53) groups were alike in the following ways: (1) all were graduates of liberal arts curricula; (2) all were involved in a fifth year of training in education; (3) all stated a definite interest in becoming teachers; (4) they were of comparable ages; (5) the sex ratio was approximately the same; and (6) all attended colleges in Arkansas. The MTAI was given one month after students had entered the fifth year phase. The mean score for the Negro group was 11.27 and that of the white group was 48.77. No tests for statistical significance were reported.

STATLER, Ellsworth S. "Characteristics of Students in a Teacher Education Course," EDUCATIONAL RESEARCH BULLETIN, Spring 1959, Volume 38, pp. 151-158.

The purpose of this study was to determine some characteristics of students enrolled in secondary education at The Ohio State University. A questionnaire was submitted to 257 students in the secondary education curriculum. It was found that there existed a high rate of transfer to education from other areas and other institutions (85 percent of the men and 55 percent of the women). The reason most frequently given for transfer was security in the teaching profession. It was concluded that for most students studied, teaching was a second choice as a profession. Secondly, it was suggested that more adequate guidance is needed on the upper secondary and higher education levels, and that improved teaching salaries and scholarship aid might help to make education a first choice as a profession.

STEFFLRE, Buford. "High School Students' Attitudes Toward Teaching" **JOURNAL OF TEACHER EDUCATION**, 1959, Volume 10, pp. 443-447.

The purpose of this study was to assess high school students' attitudes about teaching. One hundred and twenty-one high school juniors were asked to put in rank order the occupations of college, elementary, and high school teaching among 20 occupations based on ten factors--prestige, choice (preference), altruism, control-authority, education, job freedom, intelligence, income, security, and self-realization. The research was designed to test four experimental hypothesis regarding attitudes: (1) by sex, (2) by status of different teaching levels, (3) inter-occupation ranking factors, and (4) where students may have a relative in the teaching profession. It was found that (1) having a teacher in the family did not influence the rankings given, (2) in general, college teaching ranked highest followed by high school teaching, and elementary school teaching last (accounted for by the rankers' knowledge of reality plus some halo effect), (3) a tendency for all three occupations to have the highest and lowest rankings on the same factors ("probably due to the close relationships of occupations"), and (4) boys and girls differed in their ranking of the several factors--girls thought more highly of teaching than did boys.

STERN, George G. and **MASLING**, Joseph. **UNCONSCIOUS FACTORS IN CAREER MOTIVATION FOR TEACHING**, Washington: U. S. Government Printing Office, 1958.

The purpose of this study was to develop suitable instruments for assessing unconscious factors in career motivation among teachers, and to relate such factors to performance in specific areas of the elementary school teaching process. A study was made of 29 teachers suggested by their colleagues as outstanding examples of eighteen motivational patterns tentatively formulated at the outset of the investigation. A detailed analysis of the interview, projective, and objective data indicated that a number of motives could be ascribed to each subject, and each one also tended to express attitudes toward teaching practices which involved several different idealogical positions. On the basis of case study analysis three questionnaires were developed. The first two questionnaires were based on statements derived directly from comments made by the teachers themselves. In addition to the foregoing, a series of classroom rating scales for the description of teacher and pupil behavior were developed in anticipation of subsequent studies to be made relating these motivational patterns to teaching. The three questionnaires were administered to a sample of 105 freshmen at Cortland State Teachers College and 42 seniors in the School of Education at Syracuse University, the latter all having completed a semester of practice teaching. The data obtained for the preliminary Teacher Preference Schedules, providing measures of gratifications (Form G 158) and attitudes (Form A 158) respectively, seem unusually promising. Both instruments were extremely high indices of item discriminations, the median being above 0.40 for all scales for both samples. A comparison of scale intercorrelations for the two schools suggests that these instruments may also be sensitive to difference in teaching experience as well as to institutional differences, this tentative conclusion being further supported by the selective correlations obtained between individual subscales and grades and intelligence for the Syracuse sample.

STIER, Leland D. "Orientation of Prospective Teachers" EDUCATIONAL FORUM, January 1961, Volume 25, pp. 167-173.

Seven hundred and eighty-two students enrolled in classes in Child Development were selected for this study. They were asked to write four response statements on "Why I Selected Teaching as a Profession" and "My Philosophy of Life". Of the 363 students indicating time of selection of teaching as a career, 30 percent of the elementary school candidates decided while still in the elementary grades as compared to 12 percent of the secondary candidates. Twenty-four percent of both groups decided in their high school or college years. Replies of 286 students indicated that family has a greater influence on the career choice of prospective elementary than secondary school teachers, while work in summer camps or playgrounds influenced the secondary teachers.

STOUT, Ruth A. "Admissions and Retention Practices in College Programs of Teacher Education", PERSONNEL AND GUIDANCE JOURNAL, Volume 34, December 1955, pp. 208-213.

The purpose of this study was to determine the extent of admissions and retention practices in college programs of teacher education. The 785 institutions which completed a questionnaire represented 91 percent of all four-year institutions preparing teachers in the United States which are accredited by regional accrediting associations. It was found that (1) 47 percent of the institutions did not want to revise standards, (2) 30 percent wanted teaching standards comparable to other professions, (3) criteria used in admission to teacher education are emotional stability, moral and ethical fitness, general intelligence, demonstrated ability to work with children and professional interest and motivation, (4) only 0.5 of one percent indicated that teacher education student grades are lower than those of other students.

TRIMMER, Russell L. "Student Teachers Talk Back" JOURNAL OF TEACHER EDUCATION, Volume 11, December 1960, pp. 537-538.

This was a study designed to investigate the reactions of student teachers toward their cooperating teachers. One 3 x 5 card was given to each student after the completion of his student teaching experience. The following question was asked: "Why would you recommend or not recommend that your cooperative teacher be asked to serve again?" Thirty-one students rated their cooperating teachers as unsatisfactory. There were ten reasons most frequently registered, with "lack of constructive criticism" having the highest number of responses. It was concluded that student teachers want to know their deficiencies.

WEISS, George David. "The Education of Women Elementary Teachers in Relation to Their Role in Society", Unpublished doctoral dissertation, The Pennsylvania State University, 1962.

This study had as its purpose to determine whether or not the curriculum followed by women elementary teachers who graduated from Kutztown State College, Pennsylvania prepared them for the problems they face as homemakers, teachers and citizens. Questionnaires were sent to 686 women who graduated from 1945 to 1957 inclusive. The data revealed that 79.8 percent of the graduates were married. At the time of the survey, 41 percent of the married women, 98.0 percent of the single women, and 75 percent of the widowed, separated or divorced were employed. In general the responses of the women seemed to indicate adequacy of preparation for personal and professional needs but only moderate adequacy for participation in community affairs.

WILK, Roger E. and COOK, Walter W. A STUDY OF FACTORS OPERATIVE IN THE SELECTIVE RETENTION OF STUDENTS IN TEACHER EDUCATION, Washington: U. S. Government Printing Office, 1963.

The purpose of this study was to describe students in one teacher education institution in such a way that factors affecting their selective retention could be identified. The subjects for this study were juniors in the College of Education, University of Minnesota for the 1956-57, 1957-58, and 1958-59 school years. The total number (2,388) of students were distributed as follows: Elementary education 1,049; Secondary Education 670; and Special Fields 669. Biographical and academic data were compiled on students from each of the classes. In addition, a battery of psychometric tests was administered. Psychometric data were as follows: High School Rank (HSR), American Council on Education Psychological Examination (ACE), the Miller Analogies (MAT), Cooperative Reading Test (CRT), the Minnesota Teacher Attitude Inventory (MTAI). Univariate and multivariate comparisons were made to detect differences in biographical, psychometric, and academic variables for the students who entered the math-science, English, elementary education, and social studies curriculums. The results of the study showed no relationship between the curriculum and the level at which students entered the degree program. Of the total who entered the four curriculums, English and math-science men most often attended small public high schools. Women in the English curriculum maintained the highest mean score on all of the tests except the MTAI. Social studies men exhibited. the lowest mean HRS and elementary women had the lowest ACE, MAT, and reading scores. The correlation between HSR and the ACE was highest for Math-Science men and lowest for English women. It was concluded that the five psychometric variables successfully differentiated among the groups.

WILK, Roger E. and **EDSON**, William H. "Predictions and Performance: An Experimental Study of Student Teachers", **JOURNAL OF TEACHER EDUCATION**, Volume 14, September 1963, pp. 308-317.

The purpose of this study was to determine the relationship between the observed behaviors of student teachers and data collected earlier at the time of their admission to the professional courses in teacher education. Subjects for the study were 36 women in elementary education in the College of Education at the University of Minnesota. At the time of admission to teacher education students were given the following tests: Miner Analogies Test (MAT), the Minnesota Teacher Aptitude Inventory (MTAI), an achievement test (HSR), and the Bowers Inventory. Sophomore grade point average was also considered. The observational methods for this study utilized two approaches. The first called the OSCAR III, was an adaptation of the Observational Schedule and Record (OSCAR) designed by Medley and Mitzel. The second method used the system of categorizing teachers' verbal behavior developed by Flanders. Data for the study were based on thirty-minute samples of teaching behavior, three, five-minute periods using each of the two observational methods. Each of the five observers visited each student teacher once during each of the two quarters. Data were analyzed through intercorrelations statistics. The F-test revealed no significant difference between the two multiple correlations. It was found that sophomore HPR (0.01 level) and MTAI (0.05) produced as high a relationship with the criterion of high OSCAR scores as did all six predictors.

WILKINSON, Rachel D. "Spelling Errors of Future Teachers" **JOURNAL OF EDUCATIONAL RESEARCH**, Volume 51, May 1958, pp. 701-705.

This study was designed to answer the questions: (1) is the spelling of future teachers of elementary children adequate? (2) what words do student teachers most frequently misspell? (3) how do prospective teachers compare in spelling ability with elementary children? The writer kept a record of spelling errors found in written assignments of 97 student teachers. The words misspelled by these students were recorded from an average of nine written assignments. No record was kept of the number of times any one word was misspelled, but a count was made of the number of students who misspelled the same word. A total of 235 words were misspelled by 73 persons, varying from a frequency of 10 to 1 misspelling per word. These data were compared with Gates study of errors made by elementary school children. The words misspelled by the student teachers were somewhat similar to the list of elementary school pupil misspellings. In addition, the nature of the errors coincided closely. "Analysis shows that spelling faults of student teachers were rather basic."

TEACHERS AND THE PROFESSION OF TEACHING

BEERY, John R. PROFESSIONAL PREPARATION AND EFFECTIVENESS OF BEGINNING TEACHERS. Coral Gables, Florida: University of Miami, 1960.

The purpose of this study is to compare the teaching effectiveness of beginning teachers who are provisionally certified because of lack of all or some of the prescribed professional preparation in education courses with the teaching effectiveness of beginning teachers who have met full certification requirements including the prescribed sequence of education courses. The subjects of the study were 36 matched pairs of elementary school teachers and 40 matched pairs of secondary school teachers. Teaching performance was judged by college of education faculty and persons not connected with teaching or professional education. On the basis of five systematic classroom observations (two by a professional educator, two by observers from professions other than teaching, and one by a general observer) the fully certified beginning teacher who had completed the prescribed courses in education were consistently and significantly rated by the observers (trained in the use of an observation form) to be more effective than the provisionally certified teachers who lacked all or part of the sequence in education courses. The differences in rating on teaching effectiveness were clearly associated with differences in professional preparation rather than with differences in background factors such as grades in college, amount of work in the subject taught, interview scores, age, or recency of graduation.

BOND, Jesse A. "Analysis of Observed Traits of Teachers Rated Superior in Demonstrating Creativeness in Teaching," JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, September 1959, pp. 7-12.

This study was designed to determine what kind of student teachers were markedly creative in teaching. Creativity was defined as "the ability to interpret for the pupil the work at hand . . . in such a way as to stimulate his curiosity and imagination . . ." Student teachers were rated on a five-point scale by trained observers, and the 245 persons who were rated superior in this quality were compared with the entire unselected group of 855 student teachers on 32 items of a rating scale. Mean scores for the creative group were higher in all 32 items than was the case with the unselected group. The rank order of the trait ratings disclosed significant differences between the creative and less creative groups. Chief among these were "resourcefulness" and "initiative" which appeared much higher in rank with both elementary and secondary creative teachers than they did on the list of the unselected group. It was concluded that creativeness is essential as a contributor to superior teaching success and that it is proportionately lacking with teachers of inferior ability.

BOOK, Desmond L. "A Note on the Relationships Between MTAI and GZTS Scores for Three Levels of Teacher Experience" JOURNAL OF EDUCATIONAL RESEARCH, Volume 55, May 1962, pp. 363-367.

The general purpose of the study was to compare Minnesota Teachers Attitude Inventory-Guilford-Zimmerman Temperament Scale trait correlations for a group of inexperienced or prospective teachers to those reported in previous studies using student and in-service teachers. Correlations for experienced teachers were obtained from a study reported by Leeds and the data for student teachers from Ferguson's dissertation. The MTAI-GZTS trait correlations for inexperienced teachers came from 196 undergraduate secondary education students. Product-moment correlations were obtained between the MTAI raw score and each of the GZTS trait raw scores. The following conclusions were presented: (1) beginning and student teachers show similar relationships between MTAI scores and each of the various GZTS traits but these relations differ from experienced teachers in that the correlations are higher for the latter group; (2) the presence of greater heterogeneity of MTAI scores among experienced teachers cannot alone be used to explain the differences in correlation between the groups; (3) the increasing size of correlations with teaching experience suggests that there may be personality changes taking place with increased participation in professional work.

COURTER, Eloise N. "The Language Beliefs and Attitudes of Minnesota Elementary Teachers," Unpublished doctoral dissertation, University of Minnesota, 1964.

The purpose of this study was to describe the attitudes and beliefs respecting the English Language of a representative group of Minnesota elementary teachers and to determine what characteristics of teacher preparation and experience might have affected these attitudes and beliefs. Within a stratified random sampling of 603 teachers, responses were received from 349, or 57.9 percent, possessing either a bachelor's or master's degree and teaching in a graded elementary school in 1960-61. Information about language attitudes and beliefs was secured by soliciting the respondents' opinions through a questionnaire consisting of seventy edited statements about the English Language, selected from periodicals, courses of study, and books about language and the teaching of English. The unanimous opinions of these language specialists on these items served as criterion for scoring for this study. Data from the employment of the questionnaire were tested with the t-test. The 0.01 level was the criterion of acceptance. It was found that although neither possession of an advanced degree nor most undergraduate preparation were significant in themselves, teachers who had earned college credit within the last five years or less showed a more informed attitude of widely accepted language ideas than those who had earned no college credit in ten years or more. Intermediate teachers scored significantly higher than primary teachers. It was concluded that this study gave no empirical evidence to substantiate the relationship of the following to attitudes about the English language: professional experiences, opinions about the adequacy of preparation to teach the English language, and opinions about the value of certain sources for language information.

DAY, Harry P. "A Study of Predictive Validity of the Minnesota Teacher Attitude Inventory," JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, September 1959, pp. 37-38.

The purpose of this study was to determine the predictive validity of the MTAI for forecasting teaching effectiveness after one year of in-service experience. The MTAI was administered to 109 college seniors immediately upon their return from internship teaching service in the public schools. These students re-took the MTAI after one year of teaching. Two ratings of these teachers' in-service teaching effectiveness were secured: (1) their principal's rating of them on the Principal-Teacher Rating Scale; and (2) their supervisors' rating for them on the BAXTER SCALE FOR RATING TEACHERS' PERSONAL EFFECTIVENESS as modified by Leeds. Correlations between the initial MTAI score and the second MTAI score, the principal rating and the supervisor rating were obtained. It was found that the predictive validity of MTAI scores are most accurate when collected immediately after student teaching when the criterion is principal's ratings of effectiveness, supervisor's ratings, or a late MTAI score. The author concludes that this does not reflect discredit on the instrument since teacher effectiveness is a complex of many factors, only one of which is attitudes the teacher holds toward pupils.

DOPKIN, Stanley and TAYLOR, Marvin. "Perceived Problems of Beginning Teachers and Related Factors," JOURNAL OF TEACHER EDUCATION, Volume 14, December 1963, pp. 384-390.

The purpose of this study was to assess the relationship between cognitive ability as assessed by the American Council on Education Psychological Examination, and grade-point average in professional courses and the reported problems of beginning teachers. A questionnaire was mailed to one hundred elementary education majors, all 1960 graduates of Queens College. All of the teachers were known to be teaching in the elementary schools. The seventy-eight subjects who responded to the questionnaire constituted the sample for this study. All of these teachers had taken thirty-two credits in elementary education, including student teaching. The questionnaire used contained 70 items, categorized into seven professional areas, ten items to an area. The areas were Discipline, Relations with Parents, Methods of

Teaching, Evaluation, Planning, Materials and Resources, and Classroom Routines. The respondents were asked to rate each item according to the difficulty the problem presented to him. The preservice variables, the total score on the ACE and grade point average, were correlated with each problem area score. It was found that average responses ranged from "somewhat difficult" to "easy to handle". The areas of Discipline, Planning, Materials and Resources, and Classroom Routines were significantly related (0.01 level) to grade-point average, and the Materials and Resources area was significantly related to the ACE scores.

ELLIS, Joseph R. "Relationship Between Aspects of Preparation and Measures of Performance of Secondary Teachers of the Social Studies" JOURNAL OF EDUCATIONAL RESEARCH, Volume 55, September 1961, pp. 24-28.

The study sought to determine relationships between aspects of the preparation of secondary social studies teachers and measures of their teaching performance. A group (N=44) rated as being outstanding teachers was compared with a group (N=26) rated by principals and students as being average and below average teachers, as indicated by scores on a check list of teacher behavior characteristics. The findings of the study were generally inconclusive. The differences between the means of the two groups with reference to each of the components of teacher education listed below were found to lack statistical significance: declared social science major; amount of social science preparation; number who completed student teaching; percent enrolled as undergraduates in other than education department; number of hours of general education courses; quality point average of professional education preparation; overall undergraduate quality point average; general education quality point average; and social studies quality point average. Statistical significance was found in a comparison of the amount of semester hours in professional education completed and in the number of teachers completing student teaching in the social studies. The investigator concludes that there appears to be strong support for the hypothesis that none of the factors considered in his research are determinative in predicting outstanding teachers of the social studies.

GOWAN, J. C., CONNER, Carita, and KENNEDY, Phyllis. "A Follow-up Study of Teaching Candidates," JOURNAL OF EDUCATIONAL RESEARCH, Volume 54, May 1961, pp. 353-355.

The primary purpose of this research was to study the relationship between training ratings and tests of student teachers with principal's ratings of these teachers several years later. To gather the training data concerning the 285 elementary and secondary teacher subjects, a consensus was arrived from pooling (1) the ratings of the master teacher in the subject's student teaching, (2) similar ratings of the supervising college instructor,

(3) a placement office rating, (4) raw score on the MTAI, (5) percentile score on an experimental teacher prognosis test, (6) grades in Educational Psychology, and (7) a class evaluation of the subject in the same course. A field rating consensus was obtained by combining (1) the principal's evaluation of 10 categories of the overall performance of the teacher, (2) a fifteen-item forced-choice selection of one of four descriptive adjectives, and (3) a list of 21 statements descriptive of a teacher's performance, any or none of which might be checked. Correlations between the training and field ratings were then obtained. There was a significant correlation of 0.28 between training and field consensus ratings. The largest correlation between a training statistic and field consensus is between class evaluation and field consensus where the correlation reached 0.37. While class grades had some relation to field consensus, neither test showed any relationship. The researcher concludes that the way in which teacher candidates are seen by their fellows is the best predictor of the way they are going to be seen both by training authorities and field raters later.

HALL, Harry O. "Effectiveness of Fully Certified and Provisionally Certified First-Year Teachers in Teaching Certain Fundamental Skills," Unpublished doctoral dissertation, University of Florida, 1962.

The purpose of this study was to ascertain whether fully certified first-year teachers were more effective than provisionally certified first-year teachers in teaching skills in certain language arts and arithmetic as measured by achievement tests. Thirty-eight first-year elementary teachers were selected from grades three, four, and five. There were 21 provisionally certified teachers and 17 fully certified teachers, none of whom had teaching experience prior to 1959. Teacher effectiveness was evaluated through a measure of pupil growth from the six test areas provided by the Stanford Achievement Tests (SAT). The sample (N=785) were tested in the fall of 1959 and again in the fall of 1960. Multiple regression methods were used with the data in the pupil gain form to study the associations of several variables. The variables were pupil I.Q., teacher grade average in college, teacher grade average in education courses, teacher age, semester hours of professional education courses taken by the teacher, and teacher scores on the How I Teach test. Mean class gains, which were the average pupil gain for one teacher's class, were examined for direction and magnitude, and the differences were then tested for significance by analysis of variance. It was found that: (1) the number of hours in professional education a teacher had taken was significantly related to pupil gain in paragraph meaning, word meaning, and spelling; (2) average gains for pupils taught by certified teachers were higher in every test area than for pupils taught by provisionally certified teachers; and (3) pupil I.Q. and hours of professional teacher education had consistently positive associations with pupil gain on selected achievement tests. It was concluded that completion of a teacher education program results in producing a more effective teacher.

HEIL, Louis M. and WASHBURNE, Carleton, "Brooklyn College Research in Teacher Effectiveness," JOURNAL OF EDUCATIONAL RESEARCH, Volume 55, May 1962, pp. 347-351.

The problem investigated was that of identifying different types of children and finding ways of measuring their growth under different kinds of teachers. Fifty-five elementary classrooms of children were classified using intelligence, achievement, social acceptance and children's feelings tests. Tests were administered at the beginning of the school year and again seven months later. The teachers were classified by profiles obtained from The Manifold Interest Schedule into Type A (turbulent, impulsive, variable), Type B (self-controlling, orderly, work oriented), and Type C (fearful). Among the preliminary tentative results are the following: (1) all categories of children made significantly more progress, as measured by the Stanford Achievement Test, under teachers of Type B than those under teachers of Type C, Type A falling in between; (2) varying children's gains depend basically upon the teacher-child combination of personality; (3) beyond the minimum professional knowledge, differences in teacher knowledge and behavior seem to have little relationship, if any, to children's achievement, the one important factor being the teacher's own personality characteristics. The essential point, the authors concluded, is that there are identifiable types of teachers and that different types have different effects on the children whom they teach; certain ones seemingly are much more generally effective than others.

KUVLESKY, William P. and BUCK, Roy C. "The Teacher-Student Relationship," University Park, Pennsylvania: The Pennsylvania State University, 1960.

The focus of this study was to determine the extent to which there is concensus among several selected groupings on a role definition for the public school teacher. A total of 2,674 respondents selected from 66 Pennsylvania school-communities and 202 teacher trainers selected from 18 state-aided colleges and universities. All respondents were interviewed during 1957. The respondents were classified into six categories: teachers, school administrators, school board members, students, other adult community residents, and teacher trainers. Respondents were asked to give their opinions and beliefs concerning the role of the teacher (1) in the classroom; and (2) in relation with students other than in the classroom. Specifically, the survey instrument was designed to answer the following questions: To what extent is there agreement among local school-community groupings on a role definition for the teachers? To what extent is there agreement among teacher trainers, teachers, and community members on a definition for the teacher's role? To what extent do size of school and situational definition influence consensus on the teacher's role definition? Answers to each part of this question were classified into seven categories representing different areas of expectations. For each of the respondent groupings counts were made of the number of individuals giving an answer classified under each of the seven response categories. The information resulting from this cross-classification provided the basis for analysis (chi square). The most significant findings are as follows: (1) there was a lack of concensus among school-community groupings on most aspects of the teacher's role; (2) there was a lack of consensus among teacher trainers, teachers, and community members on most aspects of the teacher's role; and (3) size of the school was not found to be related to degree of consensus among the selected groupings. It was concluded that one should proceed with caution in defining the teacher's role.

LINDVALL, C. M. and HOOKER, Clifford P. "Teachers Colleges Versus Liberal Arts Colleges in Teacher Preparation," PHI DELTA KAPPAN, March 1960, Volume 41, pp. 260-263.

The purpose of this study was to determine if liberal arts teachers function better in practice than graduates of teachers colleges. The sample for this study was 38 elementary school teachers in seven schools of a large system. These 38 were divided into two groups of 19 on the basis of whether they were prepared by teachers colleges or liberal arts colleges. Individuals were matched with respect to the grade they taught, the length of their service, and the highest degree held. Doctoral students observed these teachers at work and found no difference in their concern for pupil interests, or in the amount of teacher interaction in the classroom. However, there were significant (chi-square; 0.01 level) differences in regard to amount of pupil participation which the two groups encouraged. Teachers college graduates tended to be more domineering and exercised greater personal control over pupils, while liberal arts graduates permitted greater pupil participation and pupil planning. Teachers college graduates showed significantly (0.01 level) higher facility for working with students in small groups.

LU PONE, Orlando J. "A Comparison of Provisionally Certified and Permanently Certified Elementary School Teachers in Selected School Districts in New York State," JOURNAL OF EDUCATIONAL RESEARCH, Volume 55, October 1961, pp. 53-63.

This study represents an effort to determine whether the provisionally certified elementary school teacher in the first, second and third year of classroom experience is as successful as the permanently certified elementary school teacher in the same years. The study used the questionnaire-inquiry technique in which the principals of the participating schools rated one provisionally certified teacher and one permanently certified teacher on a one-to-one basis. The findings, using an analysis of variance data treatment, indicate that the permanently certified elementary school teacher is more successful in teaching effectiveness than the provisionally certified teacher in the first, second and third years of experience in the following areas: the ability to organize and plan effectively; the skill to translate subject matter into living experience; the proficiency in using effectively related materials in classroom instruction; an understanding and more sympathetic attitude toward the child; and the adequate use of such resources as remedial reading teacher, speech therapist, art and music specialists, school nurse and school psychologist in the further understanding of the child. In instructional skill, there were significant differences between the second and third year teacher as compared with the first year teacher.

MARCIKONIS, Paul J. "A Comparative Study of Teaching Difficulties of Beginning Teachers" TEACHER EDUCATION QUARTERLY, Volume 12, Spring 1955, pp. 84-88.

The purpose of this investigation was to identify the teaching difficulties of beginning elementary teachers. Questionnaires were received from 320 elementary teachers with one to two years on the job. Their supervisory officials returned 368 usable questionnaires. Both groups were asked to state difficulties they have encountered on the job. It was found that teachers and administrators recognized similar problems of beginning teachers. Both ranked "Determining Amount of Freedom to Allow Pupils", "Handling Discipline Cases", and "Keeping Pupils From Wasting Time" as the most important difficulties confronting beginning teachers.

MASSEY, Harold W. and VINEYARD, Edwin E. "Relationship Between Scholarship and First-Year Teaching Success" JOURNAL OF TEACHER EDUCATION, Volume 9, Spring 1958, pp. 297-300.

The purpose of this study was to determine the relationship, if any, between the first-year teaching success of 62 graduates of Panhandle A and M College and their previous scholastic achievement. The immediate supervisors of the first-year teachers were asked to rate them on a five-point scale (the scale contained items such as "personality", "mastery of subject matter", "dependability", etc.). Product-moment coefficients of correlation were calculated between the ratings on each of the evaluative criteria and grade point averages earned by teachers while still in college. It was found that statistically significant relationships existed between scholastic achievement and factors of subject matter mastery (0.01 level); competence in English expression (0.01 level); general culture; and character, standards, and ideals. Other factors except the first two were significant at the 0.05 level. It was concluded that a completely satisfactory technique for treating data relative to teaching success is yet to be produced. Factors in teaching as they relate to pupil growth and achievement appear to deserve further study.

MCAULAY, G. D. "Weaknesses in the Social Studies Methods Courses," EDUCATION, December 1960, Volume 81, pp. 245-246.

A questionnaire was submitted to 64 elementary teachers in an attempt to determine how adequately the methods course in the social studies prepared them to teach that subject. These beginning teachers felt that they had experienced too much lecture, and too little demonstration. They felt they needed more knowledge of how to introduce and carry out group work in the classroom, greater understanding of social studies in the primary grades, more text book evaluation techniques, and more insight into how and where to gather current event news and how to present it.

MORETZ, Elmo E. "A Study of the Comparative Effectiveness of Fifth-Grade Teachers with and without the Master's Degree," Unpublished doctoral dissertation, University of Miami, 1962.

This study was conducted in an effort to ascertain whether teachers with the master's degree were more effective than teachers with the bachelor's degree. Fifty-two pairs of teachers were matched "on certain background variables." Subjects were asked to take the Ryan's Teacher Characteristics Schedule (TCS). Classroom effectiveness was assussed by fourteen College of Education faculty members and fourteen curriculum supervisors from the public schools. Supervisors and college faculty members rated both teachers in a given pair. Mean gains made by 1,311 fifth-grade pupils on the Stanford Achievement Test (SAT) was also a measure of teacher effectiveness used. It was found that (1) teachers with the master's degree scored higher on the TCS, with the difference on verbal understanding significant at the 0.05 level; (2) combined faculty-curriculum supervisor ratings revealed no difference in the classroom effectiveness of the two groups; (3) in the pupil growth analysis, pupils taught by bachelor's degree teachers made greater gains (significant at the 5 percent level) in arithmetic computation. It was concluded that the three criteria used indicated only slightly the superiority of teachers with the master's degree.

RABINOWITZ, William and CRAWFORD, Kay E. Teacher Education Graduates of 1954, Board of Higher Education of the City of New York: August 1960.

This was a follow-up study of graduates of certain New York City colleges. In 1959 a questionnaire survey was conducted among the 1953-1954 teacher education graduates of municipal colleges. At the time of the survey approximately five years had passed since the subjects were graduated from college. Completed questionnaires were returned by 1144 graduates, over seventy percent of the group to whom they were mailed. It was found that ninety-four percent of the respondents had been employed as teachers at some time during the five-year period after graduation; only six percent had never taught. It was also found (1) that fifty-one percent were currently employed as teachers, (2) sixty-four percent of the teaching respondents were located in New York City, (3) fifty-six percent of the teaching graduates in elementary education who were working the New York City Schools were assigned to "difficult" schools, (4) about eighty-five percent of those now teaching evaluated their teaching experience as either "fairly satisfying" or "very satisfying".

REED, Helen Miriam. "An Appraisal of Selected Aspects of the Undergraduate Teacher Education Program for Secondary School Teachers at the University of Kentucky," Unpublished doctoral dissertation, Indiana University, 1954.

This study was conducted in order to obtain data which might be used in improving the undergraduate teacher education program at the University of Kentucky. Interview guides were used with 46 beginning teachers, who were graduates of the University of Kentucky. It was recommended by the group that more education student public school observations and participation take place prior to student teaching. They also recommended full-time student teaching in more than one subject.

REGIER, Harold G. "An Evaluation of Teacher Competencies of A Selected Group of Graduates of the School of Education, University of Kansas," Unpublished doctoral dissertation, University of Kansas, 1962.

The study had as its intent to evaluate the teacher preparation program at the University of Kansas by studying competencies of practicing teachers. A questionnaire listing 52 items describing teacher competencies was prepared by the investigator and mailed to 358 teachers and to each of the building principals of these teachers. The teacher sample included all School of Education graduates at the University of Kansas. The principal was asked to rate the competence of the teacher and the teacher was asked to make an evaluation of his competence, using a five-point scale. A total of 186 questionnaires returned by teachers were matched with 212 returns from administrators. In comparing results a relatively high positive correlation (0.91) was found for the pre-service responses and 0.88 for those marked "in-service". This indicated that teachers and administrators were in close agreement when rankings were compared using Speakman rank Correlation Coefficient. Ratings of teacher competence, using a five-point scale, were relatively high. Comparing mean ratings of competence there were 34 out of the 52 items in which administrators rated teachers higher than teachers rated themselves. Differences in mean ratings were significant for 14 of the 52 items, either at the 5 percent or the 1 percent level of probability, using the t-test. It was concluded that teachers and administrators were able to identify which teacher competencies can be developed best during "pre-service" education and which competencies should be kept to the "in-service" period.

RHODES, Fred G. and PECKHAM, Dorothy R. "Evaluative Reports on Student Teachers," JOURNAL OF TEACHER EDUCATION, Volume 11, December 1960, pp. 520-523.

This was a study which sought to determine those personal qualities and professional competencies considered most important in written evaluations by 31 school districts which employ graduates of Los Angeles State College. All items checked under "personal qualities" in a checklist sent to 31 administrators were considered important. The three personal qualities judged to be most important were (1) emotional poise, (2) helath and vitality, and (3) courtesy and tact. Under "professional competence", the items judged to be most important were (1) ability to plan lessons and motivate learners, (2) knowledge of basic skills, (3) development of pupil morale and (4) attention to individual differences. Forty-four percent of the administrators wanted a report of the student's alertness and enthusiasm and 37 percent wanted to know as much as possible about the student's professional competence. It was concluded that college student teaching supervisors should give attention to the seven highest ranking areas mentioned above in writing letters of recommendation.

STANDLEE, L. S. and POPHAM, W. J. "The Case of the Missing Teachers," INDIANA TEACHER, Volume 102, March, 1958, p. 316.

The purpose of this study was to determine the supply and retention of public school teachers in Indiana. Data were obtained regarding (1) the number of graduates from the 24 Indiana colleges and universities with standard accreditation for teacher education in the 1954 calendar year who were qualified to teach; (2) the number of these graduates who had teaching experience prior to receipt of the bachelor's degree; and (3) the number of these graduates teaching in Indiana public schools three years later (the 1956-57 academic year). It was found that the 24 Indiana colleges graduated 2,332 teachers in 1954. Only 37.5 percent of these graduates were teaching in Indiana three years later. Of the original 2,332 graduates only 1,954 were potential new teachers, i.e., had not taught prior to receipt of the bachelor's degree. Of this latter number, only 29.7 percent were teaching in Indiana three years later. Also, it was found that more graduates leave Indiana to teach than come from other states to teach in Indiana. It was concluded that Indiana cannot meet the demand for public school teachers by simply graduating more people qualified to teach. It was suggested that the holding power of Indiana public schools should be increased.

STANDLEE, L. S., POPHAM, W. J., and MAURIDES, E. "Preparation and Performance of Indiana Teacher-Training Graduates," RESEARCH REPORT NO. 1, Bloomington: School of Education, Indiana University.

The purpose of this study was to determine whether graduates of different sizes and types of teacher-education institutions have a different preparation for teaching, and whether there are differences in the professional performance of graduates of different sizes and types of teacher-education institutions. The measures of teacher preparation consisted of credit hours and credit points in various courses and combinations of courses. These were obtained by performing a content analysis of undergraduate transcripts. The measures of teacher performance consisted of Minnesota Teacher Attitude Inventory (MTAI), scores and principals' ratings on the Teacher Ranking Form (TRF). Size and type of graduating institutions were: large public (19,874 to 13,776 students), small public (4,362 to 2,841 students), large private (3,733 to 1,974 students), and small private (967 to 207) students. Measures were also taken of certain background factors prior to entering the graduating institution and of current teaching background factors. It was found that there were many slight differences in the preparation and performance of graduates of different types and sizes of teacher-education institutions. There were also differences in certain background dimensions, both current and prior to entering the graduating institution. It was concluded that, although these differences existed, they were not sufficiently inclusive to warrant the assertion that any one size or type of teacher-education institution is producing better teachers.

STANDLEE, L. S. and POPHAM, W. J. "Professional and Academic Preparation of Teachers Related to Two Indices of Teaching Performance," RESEARCH REPORT NO. 3, Bloomington: School of Education, University of Indiana.

The purpose of the present investigation was to determine whether the professional and/or academic preparation of teachers is related to their teaching performance. The subjects consisted of 880 public school teachers who were 1954 graduates of 24 Indiana teacher-training institutions with standard accreditation for teacher education. This number (880) was the total population graduating from Indiana teacher-training institutions in 1954. The indices of professional and academic preparation consisted of credit hours and credit points. Professional preparation was defined as any course in education or psychology. Academic preparation was defined as courses taken in the subject-matter area that the teacher was currently teaching. The academic preparation of only secondary teachers was analyzed. The credit hours and credit points were taken from the students' undergraduate transcripts. Credit points were computed by multiplying credit hours by grade and weight. The indices of teaching performance consisted of teachers' Minnesota Teacher Attitude Inventory (MTAI) scores and principals' ratings of teachers. Academic preparation and the indices were analyzed by the chi square statistics. It was found that neither the professional nor the academic preparation of teachers was found to be significantly related to either the two indices of teaching performance.

STANDLEE, L. S. and POPHAM, W. J. "Too Much 'Pedagogy' In Teacher Education," NASSP BULLETIN, Volume 45, December 1961, pp. 80-81.

An analysis was made of the college preparation and of the professional performance of 880 Indiana public school teachers. Indices of academic (subject matter) preparation and of professional (teaching methods, theory, etc.) preparation were analyzed statistically in terms of their relationship to two indices of professional performance. The indices of academic and professional preparation were (1) credit hours and (2) grade credit points in the teacher's academic and professional courses. The indices of professional performance were (1) principal's ratings of teachers' over-all teaching effectiveness and (2) teachers' Minnesota Teacher Attitude Inventory (MTAI) scores, and index of a teacher's likeliness to establish good rapport with students. Separate statistical tests (chi-square) were conducted for elementary and secondary-school teachers. Results of the analysis indicated that there were no significant relationships between either academic preparation or professional preparation and professional performance. In other words, neither the quantity (credit hours) nor quality (grade credit points) of either academic or professional preparation was predictive of graduates' teaching performance three years after graduation. The investigators concluded that factors other than formal preparation play an important part in teacher performance.

POPHAM, W. James. "Out-of-School Activities of Teachers As Related to an Index of Their Professional Performance," Bloomington: School of Education, Indiana University, 1958 (Contract 6400, U. S. Office of Education).

This study was designed to explore the relationships between teachers' out-of-school activities and their professional performance. Also considered as an index of professional performance was teachers' attitude toward pupil-teacher relations. A total of 1,954 graduates of the 24 Indiana institutions of higher learning with standard accreditation for teacher education comprised the sample for this study. Only those graduates (N=880) who were professionally employed by the public school of Indiana during the 1956-57 academic year were selected as subjects. Copies of the Minnesota Teacher Attitude Inventory (MTAI) and the out-of-school activities questionnaire were administered by mail to all teachers in the sample. Of the original sample, 738 subjects, or 83.9 percent, returned completed research materials. Relationships between teachers' out-of-school activities and their attitudes toward pupil-teacher relations were analyzed from the data supplied by these 738 teachers. The relationships were tested for significance by means of the chi square statistic. It was found (1) that there was a tendency for female teachers to obtain higher scores on the MTAI than male teachers; (2) teachers in the lower grades tended to obtain higher scores on the MTAI. The relationship was significant at the 0.01 level of confidence; (3) subjects who attended professional meetings frequently, and read professional publications tended to have higher scores on the MTAI; and (4) no significant relationship was present between teacher attitude toward pupil-teacher relations and teacher participation in: commercial entertainment activities, non-commercial entertainment activities.

WHITE, J. B. Florida Study of Teacher Education. Gainesville: University of Florida, 1958.

The purposes of this study were: (1) to discover the difference between fully certified teachers and teachers holding Temporary Certificates as reflected by the teacher's evaluation of his pre-service program, the principal's evaluation of the pre-service programs, and the teacher's attitude toward teaching and children as revealed by the Minnesota Teacher Attitude Inventory (MTAI); and (2) to discover the major areas of strengths and weaknesses in the pre-service programs as seen by teachers and principals. Each county superintendent in the state of Florida was requested to supply the names of all beginning teachers. In addition to names of teachers an effort was made to secure the following information: (1) the type of certificate held by each teacher; (2) the teacher's evaluation of his pre-service program; (3) the principal's evaluation of the pre-service program as indicated by the effectiveness of the teacher; and (4) the scores on MTAI. The sample included 2,372 white beginning teachers, 48 percent of whom were prepared in Florida teacher preparation institutions and 710 Negro teachers, 73 percent of whom were prepared in institutions of the state. Relationships of various evaluations were examined by correlational analysis. It was found that: (1) all Florida counties employ beginning teachers; (2) most of the beginning teachers who are issued Temporary Certificates have deficiencies in professional preparation; (3) use of the teacher's evaluation form, the principal's evaluation form and the MTAI showed no significant differences between teachers prepared in Florida institutions and those prepared in institutions in other states; (4) beginning teachers who have completed five years of college are more successful than those who have completed four years of college; (5) teachers who hold Graduate Certificates feel more kindly toward children and teaching than those who have Temporary Certificates; (6) there is a significant relationship between the principal's and teacher's evaluation of the pre-service program (0.05 level).

WHITE, Kenneth E. "Where Are They Now? -- A Study of Teacher Supply in Mathematics and Science," JOURNAL OF EDUCATIONAL RESEARCH, Volume 53, May 1960, pp. 331-335.

This was a follow-up study of persons qualified to teach mathematics, chemistry, and physics to obtain information concerning their present status in respect to teaching. The study included 230 individuals who graduated from college between 1947 and 1956. Data were gathered by means of a mailed questionnaire, and were organized in raw figures and percents. The following are among the findings: (1) fewer than 50 percent of the respondents are currently engaged in secondary teaching; (2) the only inducement that would have substantially reduced the loss of personnel would have been improved financial status. The current supply of teachers in these fields would be approximately 25 percent greater if salaries were more suitable; (3) many teachers left teaching because of pregnancy and because of promotion to administrative positions. Dissatisfaction with teaching was not a major reason for leaving.

CHAPTER III

STATUS OF RESEARCH IN TEACHER EDUCATION

RESEARCH IN TEACHER EDUCATION: PROBLEMS, ANALYSIS, AND CRITICISM

B. Othanel Smith and Milton Meux
University of Illinois

The theme of this paper is the simple platitude that a program of teacher education is no better than the subject matter of which it is composed, and that the primary task of research is to select the content of the program and to determine the effects of different procedures of giving instruction in it. This paper is not about studies that attempt to predict teaching success; it is not about inquiries that try to describe the characteristics of teachers or to supply criteria for selecting students. Neither does it treat studies that deal with the organization and administration of teacher education. All these sorts of inquiries, important as they may be, are peripheral to the problems of teacher training.

What is Research in Teacher Education?

How, if at all, does research in teacher education differ from research in general education, vocational education, and so on? The difference between such research and research in other sorts of education does not consist in differences of logic or methodology, but rather in the problems studied. When we inquire into problems about the training of teachers or other school personnel, we call such inquiry research in teacher education. When we study problems about teaching and learning in the elementary and secondary school, we do not think of these studies as being in the field of teacher training. To inquire into the effects of student teaching on the attitudes of prospective teachers toward their students is to study a problem in the education of teachers, but to study the factors affecting the attitudes of high school students toward economic questions is to study a problem in general education.

On closer inspection it becomes clear that at one point, at least, the line between these two spheres of research is not so easily drawn. The factors which affect the attitudes of high school students toward economic affairs may be important items of content in a program of teacher training. Research in teacher education is thus easily confused with research in other spheres of education at points where the results of the latter afford content for teacher training. At all other points, however, the two can be separated rather easily. By ruling out studies which supply the content of teacher training we can draw a clear-cut distinction between inquiries in teacher education and all other educational research. This sort of division is also found in other fields. For example, research in science education does not include research in physics, chemistry, or biology; not does research in medical education include studies in medical science _per se_.

Although this distinction is useful in delimiting the subject of research in teacher education for purposes of the present discussion, perhaps it should not be made hard and fast. Research in general education, vocational education, and so on, deals with problems of instruction in the same sense as research in teacher education. But there is not the same sort of parallel in other professional fields. For example, research in materia medica does not deal with instructional problems, as medical research does, but with drugs and their uses.

Problems Studied in Teacher Education

From an analysis of the recent research in teacher education abstracted and compiled by Cyphert and Spaights as well as from reviews of earlier studies, it can be seen that research workers have been concerned primarily with four questions:

1. What are the present practices in teacher education? Among studies designed to answer this question are those which attempt to find out what objectives shape the direction of training programs, together with the content and its placement in the program. There are also studies which report administrative practices, kinds of preparation given to junior high school and other types of teachers, and duplication of courses.

2. What elements of personality are associated with different kinds of teaching behavior? Studies dealing in one way or another with this question report the relation of personality variables to certain teaching behaviors, or else, to verbally expressed attitudes. Among these studies are those which deal with the effects of anxiety on teaching behaviors, relation between self-concepts and teaching attitudes, and social backgrounds of teachers and their attitudes toward students. Such investigations as these supposedly bear either upon the selection of candidates for teacher training, or else, upon the program of training.

3. What aspects of training and experience are associated with different kinds of teaching behavior or criteria of teaching success? The studies dealing with this question attempt to predict how well prospective teachers will do in student teaching or how well they will do once they are on the job. The data used in these studies, for example, are those found in placement records, data about academic work, pre-service experience, verbal facility and other psychological characteristics. The purpose of such investigations as these is apparently to determine criteria by which to select students for teacher training programs and to provide information as to the effects of certain aspects of training and experience.

4. What are the comparative effects of different ways of training teachers and other educational personnel? Research workers have studied the comparative effects of various methods of training teachers -- technological media vs. field trips and observational procedures and techniques; integrated vs. conventional courses; problem method vs. lecture or discussion method, to mention only a few of the treatments that have been studied. These inquiries are designed to find out whether or not one way of dealing with content and students has greater or less effect than another way.

The foregoing summary is admittedly a bird's-eye view of research in teacher education, and suffers from errors of detail which observation from a distance necessarily involves. Yet it serves a useful purpose. It enables us to disentangle ourselves from the details of particular studies, to see more clearly the larger features of the total field and thus to tell what we are neglecting, or else failing to see altogether.

The bird's-eye view helps us to see that the basic problem in developing any instructional program -- the problem of deciding what content is to be included -- is entirely overlooked by research workers in teacher education. Education courses draw their content from educational science, psychology, sociology, history, philosophy, and practical experience and philosophical work. Psychology and sociology have also made significant scientific advances in the last fifty years. Yet no systematic effort has been made to survey and assess the knowledge of these sources as content for teacher education. The only attempt to determine what prospective teachers should be taught was made by Charters and Waples over thirty years ago. They approached the problem through job analysis that provided a functional description of the teacher's work but few clues to the content relevant to his training.

The selection of content has been left largely to textbook writers. But the profession of education cannot relegate the task of determining the content of its training program to individual authorities, no matter how competent. For one thing, this practice has been repudiated as a method of curriculum building in the elementary and secondary schools. For another thing, the work of the teacher is influenced by information from diverse fields of knowledge, and few, if any, single individuals can claim competence in more than one of these fields. For still another thing, existing programs of teacher training are replete with useless residues from theoretical speculations about teaching and learning, pedagogical lore, and practical experience; and nothing short of a concerted effort will weed out these residues and replace them with useful information.

The last point is worthy of special consideration. Research workers have gone ahead making study after study as though the subject matter now included in Education courses were adequate; as though the primary tasks were to find effective ways of organizing and teaching the content and of placing it properly in the training program. In other words, research in teacher education is apparently conducted on the assumption that if students can be selected whose personalities are suitable for teaching and who have the capacity to acquire the ways of behaving expected of teachers, a successful product can be turned out by proper instruction.

Whatever may be required for a successful program of teacher training, one thing is certain: a program can be successful if, and only if, its content is valid. The reason for this claim is not far to seek. To serve its social function, the personnel of any profession must be trained to follow appropriate methods of treating persons, substances, or subjects, depending upon the profession. The worth of professional training depends upon the validity of the treatments that are taught. If the treatments are worthless, or if they are nothing more than the exercise of common sense, training in them is superfluous.

The training of physicians to treat common colds is worthless for the simple reason that there is no treatment save that which everyone knows as a matter of common knowledge. Anyone can treat a cold as well as the best physician can treat it.

In addition to valid treatments, a professional personnel should be trained in the concepts by which to classify and understand the phenomena with which it deals. The physician knows that colds are the result of virus infections. But in common sense colds are due to sleeping in a draft, to wet feet and other forms of exposure. Ideally, both the understanding and the treatment of a phenomenon by a professional should be more adequate than that afforded by common sense. But sometimes a professional man's understanding of a phenomenon runs far ahead of common sense even though his treatment may be no better than that afforded by everyday wisdom, as in the case of colds. One sometimes suspects that in education our understanding is usually more valid than our treatments.

The primary task of research in teacher education is precisely that of selecting valid treatments and concepts, where they have been established, from the various sources of pedagogical content. There is an extensive body of knowledge about human growth and development, emotional behavior, and how information and skills are learned; about the measurement of achievement, intelligence, and other psychological dimensions; about grouping and organizing of students for instruction, and numerous other features of school work. Teachers may use appropriately selected elements of this knowledge to interpret the behavior of students and other phenomena occurring in his work; that is to say, he may classify objects and events in his work by references to concepts, and thus understanding them, respond more appropriately. For example, if a student annoys others, the teacher may interpret the student's behavior as reflecting need for attention and approval. Or, if a student becomes militant toward the teacher, his behavior may be understood as stemming from frustrations suffered either in school or at home. These modes of interpretation are rooted in scientific knowledge about human behavior. They have replaced such older notions as the devil causes individuals to behave that way, or such behavior is due to bad temper.

While the sources of professional knowledge should be sifted for concepts useful in the teacher's work, even more effort should be made to search out valid treatments. The identification and selection of such treatments is more difficult than the selection of conceptual and factual knowledge. In the first place, the profession of teaching has a long history of substituting doctrines, fads, _ad hoc_ remedies, and, at best, practical experience, for tested means. And even now these substitutes have a way of sneaking into our scientific investigations and training programs. Suffice it to point out as an example that some of the untested doctrines of the progressive movement of the 20's and 30's are now being lugged back into teacher training courses as valid ways of educating the gifted. Ane one suspects that Bruner's little book The Process of Education has been warmly embraced because it does the same thing, although under a slightly different set of symbols.

In the second place, the search for treatments to be found in the literature requires a broader perspective than that usually exercised by the authors of texts. Consider, for example, the teaching of concepts. It is generally agreed that concepts in science, mathematics, literature, and so forth, make up one of the basic components of an educational program. The question of how to treat concepts as we deal with them in instruction is a matter of crucial importance. Yet, if we turn to the content of teacher education programs we find little information about how to deal with concepts in the process of instruction. Of two widely used texts in educational psychology one devotes less than four pages to the teaching and learning of concepts and the other one devotes a chapter to the topic. They contain some discussion of what concepts are and how concepts are acquired, but they give little, or no information about what the teacher is to do as he teaches concepts.

During the past year, a team of us at the University of Illinois has been analyzing classroom discourse to determine what teachers do when they teach concepts. Our analysis shows that high school teachers and their students engage in at least fourteen different sorts of operations as concepts are taught. They do not perform all of these operations in connection with any one concept. They may, in fact, perform only one of them, but as a rule a number of these operations will be performed as any one concept is taught. The sequence of these operations will also vary as the class discussion moves from one concept to another.

If the performance of teachers as they teach concepts is laid alongside of what the books on psychology of learning and instructional methods say about the teaching and learning of concepts, it will be found that the books are rather poverty-stricken in comparison to what high school teachers actually do. The behavior of teachers and students as concepts are being taught and learned is much richer, more complex, and more involved psychologically and logically than textbook descriptions of how concepts are to be taught and learned. Apparently knowledge about the teaching and learning of concepts stored up in the structure of our language and in the structure of subject matter is already far ahead of what we are now teaching in our professional courses. Likewise, the knowledge in works on logic, psychology, philosophy of science, etc., have implications for the teaching of concepts that are far more extensive than the suggestions found in the tabloid accounts given in works on educational psychology and teaching. The same observation could be made about the teaching of all forms of knowledge, with the possible exception of skills.

Until we have sifted all sources of information about teaching and other aspects of our professional work and thereby selected a dependable body of concepts and know-how as the content of teacher training programs, little defense can be made for carrying on research in other phases of teacher education. To go back to our analogy, it makes no difference how the prospective physician is trained to treat colds -- whether he is taught by audio-visual methods, through integrated courses, by observation and practice, or what have you -- he will still be no more successful than the layman in dealing with colds. By the same token, it will be of little avail if we carry on research to find out the effects of various ways of training teachers to do this and that unless this and that are valid treatments.

Let us assume that a valid content has been selected. We may then turn to the question of determining the effects of different ways of training teachers. One of the most persistent patterns of research in teacher education is what we here call comparative studies. They are similar to clinical research in medicine where the effects of different treatments are tested out. In comparative studies the effects of one method are compared to those of another. For example, the effects of the problem-solving method are compared to those of the lecture method in professional courses, or the use of media in professional instruction is compared to field trips and other forms of observation as to their results. Comparative studies of other treatments are too numerous to mention here.

The inconclusive results of comparative studies in all kinds of schooling, including teacher education, are well known. The failure of these studies to yield consistent results has been attributed to ill-conceived research designs, inadequate measuring instruments, complexity of experimental situations, and to other reasons that will readily come to mind. These criticisms are not to be discounted. There are problems in research design and measurement that can be neglected only at considerable risk.

But at the same time it is possible that the trouble lies in part at a conceptual level. There seems to be, at least, three conceptual dimensions or sets of factors in comparative research: first, the instructional situation; second, the treatment; and, third, administration of the treatment. The following discussion of these three sets of factors is specifically directed to research in teacher education. It should be clear, however, that what is said applies with equal force to research in other spheres of education.

The Instructional Situation as a System

The instructional situation is a system of factors. By a system is here meant that the factors are related to one another, that they interact, and that together they constitute a unit which can be analyzed and studied empirically to determine the regulatities that hold within it. These regularities will obtain for the class of all instructional situations, but there may be sub-classes in which additional regularities will be found. Furthermore, it should be noted that the instructional situation can be studied quite apart from treatments and their administration. In fact, it may well be that the failure to obtain consistent results from comparative studies of treatments is due in part to the fact that the instructional situation has not been studied on its own account and hence the regularities that affect treatments have not been recognized.

It is not the purpose here to set forth the factors and regularities that make up the instructional situation as a system. Indeed, to do so would perhaps require more knowledge than is now available in the literature. But for illustrative purposes we can cite a few factors and their possible interactions.

Instruction takes place through verbal expression, usually as verbal interchange. Verbal expression has a number of dimensions. It exhibits differing degrees of depth, as when classroom discourse moves from a simple explanation of a topic to more and more complex levels. Verbal expression has varying degrees of consistency. It can be associative, lacking in logical relations almost entirely, or it can be coldly consistent as in mathematical discourse. Between those two extremes can be found all degrees of logicality. Also, verbal expression displays differing degrees of clarity. Discussion can be so vague that the topic is barely identifiable, if at all, or so clear that no one can mistake what is being said about it. It can be descriptive or valuative. Discourse can also be direct or indirect, as defined by Flanders. Furthermore, verbal behavior in the classroom exhibits differing amounts of interchange, expressible as ratios between measures of teacher and student behavior, teacher-student interchanges and student-student interchanges.

How are the foregoing dimensions of verbal behavior related to one another? We have very little empirical information bearing on this question. But some speculative hypotheses may be worth noting. It has been held for a long time that the amount of learning is related to the amount of participation of students in class discussion. In other words, if students are involved in discussion, it is assumed that they are more apt to understand what is being discussed and in this way learn more than they would otherwise. There are reasons why this hypothesis -- the relation between the amount of interchange and the amount of learning -- may be questioned, but that aspect of the matter is beside the point. We wish to point out only that it is possible to study the classroom as a system and to investigate the relations among the variables in such a way as to find out which variables are associated with verbal interchange. In this way, it is possible to discover the conditions that depress student participation as well as those that increase it.

In our study of classroom discourse we have noted, incidentally, that there appears to be a relationship between the number of students taking part in the discussion and the quality of the discourse. For example, if the teacher directs the discussion in such a way as to increase its clarity, depth, and consistency, or to increase the force of any one of these variables, the amount of interchange and the number of students taking part appears to be markedly decreased. To put the matter the other way around, the less clear the discussion, the more rambling and the more shallow it is, the greater is the number of students wanting to get into the act and the more they participate. There is reason to think that the same sort of apparent relationship would be found in professional classes having to do with the training of teachers.

The point here is not that student participation is necessarily associated with vagueness, inconsistency, and superficiality. What is suggested by these observations is that there seems to be a relationship, and that if we wish class discussion to be carried on in ways that will not reduce the clarity, consistency, and depth of thought, then we must look into the question of what variables in the instructional system can be manipulated so that the discussion can be maintained at a high quality level. As of this moment, we are none too clear as to what to do to offset the tendency toward vagueness and superficiality and at the same time maintain high ratios of verbal interchange.

The instructional situation also involves certain psychological and social factors. It is apparent that some teachers, as well as students, have cognitive preferences. For example, some teachers prefer to deal with details and thus neglect the general ideas of the material they are dealing with. On the other hand, other teachers prefer to discuss generalizations, and, in consequence, overlook the details which support the more general conceptions and principles. The same sort of preferences may be found also among students. These sorts of preferences will probably influence the quality of classroom discourse, shaping its various twists and turns and determining, in part, who will participate. There are also variables such as social distance between teacher and students, and among students themselves. And then there are variables having to do with the kind of knowledge being dealt with in the discourse -- knowledge of concepts, generalizations and laws, interpretative principles and norms. Each of these sorts of variables may influence in one way or another the character of instructional discourse and the amount of verbal interchange occurring in the classroom.

No claim is made for the validity of any suggested relationship among the variables mentioned in the foregoing discussion. The sole purpose of the analysis is to indicate what is meant by calling the instructional situation a system and to emphasize the importance of studying the system as such. It is possible, and also desirable initially, to investigate the variables within the system and their interdependence, before raising the question of the effect of the system upon learning.

Treatments and Comparative Studies

Viewed from the standpoint of the classroom as a system, comparative studies introduce what has traditionally been called the experimental factor and this factor we refer to as the treatment. Until recently it was not recognized that the treatment was not a single variable but a complex set of operations, a change in any one of which modifies the treatment, undoubtedly its effects, and hence the results of the investigation. We have substituted vague notions and pseudo-concepts for accurate descriptions of treatments, using names such as lecture method, problem method, observation procedures, and integrated courses as though their referents were well-known. Unfortunately, these terms do not represent clear-cut concepts. What sort of behavior constitutes problem-solving teaching? What teaching behavior makes up the lecture method? What pattern of organization is referred to by the expression "integrated courses"? Were we to try to specify the criteria by which these behaviors and this particular organization of materials are to be identified, the capriciousness of our ideas would become strikingly evident. Consider the lecture method. We would doubtless agree that in this method the teacher does most of the talking. But how much talking must a teacher engage in before we say he is using the lecture method, and just precisely what kind of talking is it to be? How is it to be organized? What sort of development of points in a lecture is to be accepted as characteristic of the method? If we are to use the lecture method as a treatment, we must first answer such questions as these, or else we shall not know what we are about.

In addition, techniques must be devised for identifying and describing each type of treatment, as it is shaped up in the classroom. It is not enough that our conceptualization of various treatments be clear. We must also be able to use these concepts in describing empirically what is going on in the process of instruction.

Now, it is precisely the failure to describe in detail, to give adequate criteria for the identification and description of particular modes of treatment, that marks one of the chief defects of comparative studies in teacher education. The findings from these studies, as already remarked, are very often conflicting, leading to inconclusive results, and often to pessimistic views with respect to the possibility of satisfactory scientific procedures in education. The fact of the case is that the treatments being compared in these studies are so ill-formed, so ill-described, that no one can tell precisely what is done. This means that the conflicting results are likely due as much to variations in the treatment from time to time in the same study, and from one investigation to another, as to any other factor in the experimental circumstances.

Moreover, we have seldom related treatments to objectives of instruction. There is good reason to suppose that the treatments used in teaching concepts in psychology, pedagogical method, and the like, are not necessarily the treatments which would be used in the teaching of general principles of explanation and control such as those involved in means-ends relationships. In other words, the behavior involved in the teaching of concepts is apt to be very different from the behavior involved in the teaching of general principles and laws. The behavior employed in teaching through observational procedures and techniques is also apt to be different from the behavior involved in teaching concepts and principles by the use of verbal materials. Yet we have devised no adequate means of describing these various behaviors for experimental purposes.

Treatments and Competence

Another source of confusion in teacher-education research is the failure to distinguish between the competence of the teacher and the validity of treatments. The competence of the teacher has to do with his understanding of, and ability to execute, the various behaviors required to attain specified ends in teaching. His competence has nothing to do with the validity of the treatments themselves. If the treatment itself is invalid, the teacher may still be efficient in administering it. But there would be no point in talking about the competence of the teacher with respect to such a treatment. No matter how well he may perform the behavior which the treatment entails, he will fail to attain the results which the treatment is supposedly designed to achieve. We can speak usefully of teacher competence only when we have valid treatments and can ascertain the degree to which the teacher is able to exercise the behavior which these treatments require.

Of course, as a teacher administers a treatment he may exercise a certain flair or style the effects of which may be beneficial in learning even though the treatment itself is invalid. But this is an aspect of teaching ingrained in the personality of the teacher and hence least apt to respond to training.

Experimental investigations in teacher education have thus far failed to separate teacher competence from treatments. What we need now to do is to work out techniques and procedures whereby treatments can be tested out quite apart from the ability of the teacher to execute them. Programed instruction may turn out to be useful in experimental studies designed to test treatments independently of teacher competence. Another possibility of separating treatments from competence is a one-way analysis of variance design with levels of competence as the independent variable and treatment effects as the dependent variable. Randomly selected teachers are assigned at random to, say, three groups. Each group is trained to administer the treatment at a given level of competence. Each teacher is then given a "class" of randomly selected students to which he administers the treatment at the competence level to which he was trained. Unbiased estimates of the treatment effects at each level of competence are then obtainable. (The accuracy with which the treatment is administered by each teacher can be checked by taping the teaching and making the necessary -- and feasible -- statistical adjustments for deviations from the competence level.)

Be that as it may, once the treatments have been established as valid, it will be possible for us to talk of the competence of the teacher in useful ways. It would, for example, be useful to talk about the competence of a physician in the treatment of colds if there were a treatment for the physician to administer that is superior to that found in the folk-lore of the culture. But, of course, there is no such treatment, and it is hence pointless to speak of his competence. The same can be said of treatments in education. Where there are no valid treatments it is useless to talk about the competence of the teacher.

What we have said about the three aspects of comparative research -- instructional situation, treatments, and teacher competence -- is simply a gross analysis of the phenomena to be inquired into. It leaves out of account the conceptual refinements which empirical work requires for its validity. Nor does it deal explicitly with research design. Rather our analysis is a sort of shakedown, a sort of first step, that one makes before undertaking the more advanced phases of empirical research. But this broad view is fundamental in the sense that it affords perspective and hence research directions. The particular perspective set forth here may prove to be inadequate, or entirely fruitless. However that may be, still the task of building an adequate perspective is primary to considerations of research designs, techniques of observation, statistical procedures, and other instruments essential to research work.

SOME STRENGTHS AND WEAKNESSES OF RESEARCH METHODOLOGY IN TEACHER EDUCATION

Raymond O. Collier, Jr.
University of Minnesota

In order to specify the context in which the following remarks were written, I have felt it necessary to make a few introductory statements. First, it should be stated that I have reacted to the research summaries provided by Cyphert (and Spaights) almost completely as they stand in the preliminary draft. In only a few cases have I referred to the original research for clarification and for a check on Cyphert's summaries. The dangers and limitations of such an approach are fairly obvious and are considered by Cyphert. There are, of course, the sampling and personal bias problems referred to by Cyphert in his original statements, but in addition my remarks will be reactions to his reactions to produce a sort of double confounding. However, any other course for me would have been laboriously impossible. Moreover, it will be seen that I have used Cyphert's seven categories of breaking down the research domain, not because I particularly agree with this breakdown, but simply because it was convenient for me to use this arrangement rather than to re-categorize.

It should be made quite clear that I am not posing as a person who is particularly knowledgeable in the field of teacher education. However, as a result of the task in which I found myself involved, I have experienced a deep feeling of interest with the fascinating problems of research that are present here.

Now one who purports to consider research methodology in any discipline can do so along many different lines. Some generally employed viewpoints by which research is judged are (a) whether the problem content is of sufficient relevance and importance either in an applied or theoretical fashion, (b) whether the design and conduct of the research was adequate for the purpose stated, (c) whether the analyses of the results, statistical or otherwise, were appropriate, and (d) whether the interpretations of the results were proper. For reasons of personal orientation, my remarks will be based on items b, c, and d above.

Finally, I should quote a point of view due to Kaplan (7) which one should keep in mind when presented with the remarks of a methodologist such as myself. "What I am protesting is the conception of the methodologist as a baseball commissioner, writing the rules; or at any rate as umpire, with power to thumb an offending player out of the game. He is at best only a coach, and the merit of his recommendations rests entirely on what the play of the game shows to be effective."

Let us proceed to consider the various sections of the research summaries specifically, and thereafter to look at the total set of summaries.

Historical Development, Scope, Functions, and Objectives

The studies reported in this section perhaps may be categorized into one of three approaches as regards methodology. As one might expect, one group of papers takes a sort of philosophical, opinion-oriented point of view and directs attention to a consideration of what is wrong with teacher education; another group of papers is concerned with an opinion-based treatment of the status of teacher education; and a third group of papers deals with the problem of scope and status quo by means of questionnaire survey methodology. In this section all of the studies reported, with the exception of two, fall into the first two categories, with the result that there are a fair number of assertions, declarations, predictions and suggestions, but little substantiation and/or analysis of contrasting

3

or opposing points of view. It would have been valuable, for me at least, to have encountered a writer who was concerned with putting down in a clear and well analyzed way some rather basic ideas on the why's and how's of teacher education. This was not found in the reports of the first section, although most of the writers indicated that they did believe in objectives and that these should be specified previous to the implementation of a teacher education program. Perhaps objectives are well known by people in the field of teacher education and to have re-specified them would have been redundant. In reading the following section, however, I was able to find in Lien's article what one group of people thought a teacher education program should do.

Under the circumstances, I was motivated to look at the opinion type articles summarized in an attempt to determine if they were written consistently, if they presented novel, or at least fruitful points of view, if some of the opinions could be translated into actual empirical research or if some of their writings could be used as a basis for structuring or restructuring the conceptual framework from which teacher education in general could profit. With few exceptions I found nothing novel nor of structural importance.

In some cases I found evidences of inconsistencies. For example, in one article the statement was made that there existed a disharmony between theory and practice in teaching. This might be criticized as being inconsistent since there exists no theory of teaching.

However, in a more positive vein, it is possible to view the articles reported as stimulators for various types of research. For example, the statement by one writer that teachers should spend sufficient time and study in one subject matter field of their interest could reasonably provide challenge to investigators to answer questions, such as "What is an optimal amount of time for teachers at various levels?", "Does studying in a single subject matter field result in optimality, as regards teacher-pupil payoff?", and "How does one optimally specify the subject matter field of interest for prospective teachers?" An article such as Cronin's, for example, does much for me at least in suggesting that there are basic new approaches which exist and which could be developed and tested and that some of this activity should presently be pursued. Another article, due to Joslin, appeared to me to present extreme assertions that cannot possibly be substantiated but indicate a need for careful evaluation of the product of teacher education. All in all, I was impressed by the extreme amount of variability as regards the potential modes of approach into an area in which there is supposedly a fair amount of basic agreement.

Organization and Administration

The research reported in this section has utilized questionnaire survey methodology almost completely for obtaining information. Underlying the various surveys reported was the very simple desire to obtain pieces of factual information concerning the existent practices of teacher education with a view to improving teacher education programs. The types of surveys employed were of a very simple sort, utilizing in general a complete enumeration and making no cross-comparisons as is many times done in the so-called analytical study. Classification and tabulation of various facts, such as percentage of teachers indicating that a certain point of view on a particular item and frequency counts of other practices as perceived by respondents seem to be the extent of the information that was desired.

In some cases representatives of teacher education institutions were asked to respond to questionnaires and in other cases teachers themselves were asked to respond. In about one-half of the surveys, the results obtained were of an extremely narrow scope, involving perhaps only a particular school or small geographical expanse. However, in other cases the surveys were of wide scope and breadth of contact. In almost every case the sampling plan was unspecified so it may be assumed that complete enumeration of a set of schools or subjects was made for either a specified or unspecified purpose.

Since in general the questionnaire was used to obtain pieces of information, one basic query which must be made is "What attempt was made to establish the validity and reliability of respondents' replies?" If the results of the survey are to be utilized at all, the accuracy of respondents' replies must certainly be established, for it is well known that respondent error constitutes a large source of error in survey work. This can be done in many different ways, e.g., spot interviewing and general re-checking. No mention of validity checks was made anywhere in the research reports.

Another point which is of tremendous import in any survey work is the problem of non-response. Obviously, there was non-response in the present surveys reported; however, it was clear nothing had been done in order to investigate even superficially the non-response category.

In order that reasonable research be done in a field, it would seem important to obtain certain pieces of information which would facilitate future endeavors. If this is the purpose of the researches in the present section, then it must be agreed that these sources of information are well worthwhile. It seemed, however, in the process that some of the researches represented terminal efforts by the individuals involved. Assuming the truth of the latter statement, one could wish for more incisive information attained by the researches.

College Faculty and Staff Personnel

As in the previous section, the form of research methodology used in this section was that of the survey by means of questionnaire and sometimes individual interviews. The desire of these researches in the main was to describe various characteristics of teacher education staff personnel, such as preparation, salary, class load and in some cases, attitude of staff and administration as regards their own job or the job of others.

In almost all of the studies summarized, the type of information obtained was of an extremely simple, uninvolved, almost superficial sort. In two of the studies, however, somewhat deeper motives were present. Thus Cowan was concerned with the role perception of education and academic staff and Feldman was interested in inter-rater agreement on college students as regards certain personality variables.

If the type of information desired on college staff personnel for whatever purpose is that of gross descriptive sort which can be obtained by individual report on a questionnaire, then the majority of the researches in this section will have used a methodology which is reasonable for their purpose. This assumes that the usual precautions of survey research were properly taken into consideration. However, it would appear that the type of items which should be produced on teacher education staff, in order that a good description of the status quo might be had, will include questionnaire survey reports only as a minimal beginning. One would desire personality descriptions, evidence obtained through observation and personal check-ups on items such as classroom behavior and even student reactions to college staff. It is clear that the methodology utilized in this section could well be augmented by the other types of methodologies in describing the attributes of faculty personnel for use in research on teacher education.

Curriculum Offerings

Again, in this subdivision a preponderance of the research summarized has been accomplished by means of questionnaire survey methodology.

The result has been a production of a relatively large amount of factual information which bears on the curriculum status quo in teacher education. Items such as the present nature of junior high school teacher education programs, enumeration of courses, fifth-year programs and other descriptions of course content or attributes of it are presented. On the other hand, some survey research was dedicated to exploring attitudes and points of view of teachers and teacher education students as regards the feasibility, workability, desirability and so on of certain conditions and practices.

It is quite clear that information such as that obtained on actual physical course offerings will be necessary to obtain a reasonable picture of the teacher education course content. However, it is to be hoped that this information will have been gathered purposively and will provide a factual basis by which vigorous research in the area of curriculum offerings will be made.

As has been stated, the survey approach to obtain information of any sort must be viewed with caution and care. For example, little has been said thus far concerning the actual form of the questionnaire and the identification of its origin. These items will become particularly critical when one attempts to assess attitudes of products of teacher education institutions when it is known that the questionnaires originate from representatives of these institutions. In summary, the major criticisms of most of the survey studies in this section, in my estimation, are not to be found in the sampling plan, nor the sparcity of the responding units, but rather in the types of information required and obtained.

Proceeding now to the few experimental studies in this section, we consider an experiment (or quasi-experiment) conducted by Cooper and Elsbree in which an elementary school teacher education program for which the professional education courses were distributed over the four years of college was compared with a program involving the same courses placed in the last two years of college. The two plans were compared on various criterion variables, such as aptitude, achievement, drop-out rates, attitudes and also a measure of success in their first teaching experience. This experiment, although interesting from the standpoint of care taken by the investigators on criteria measured, suffers from a common methodological disturbance, the potential inequality of the two non-random groups of students on variables not measured within the experimental setting. Moreover, it is not clear that the variable, employer's opinion, used after graduation, was checked for validity, reliability and unbiasedness from group to group. However, the use of an "experimental procedure" to compare to plans in teacher education is a heartening beginning.

Another reported experiment concerned with the accomplishment of a course in curriculum theory seemed reasonably conceived as regards the criterion, but suffered from the fact that there was only a pre-post measurement on one group and no comparison or control group. This fact, plus the author's conclusions, which speak of the effectiveness of the course in a causal manner, leads one to the usual criticism of such an experimental procedure.

A third two-group experimental comparative study, concerned with attitudinal changes between part-time and full-time student teachers, also fell prey to the non-random, intact groups effect. Assuming, however, that the part-time and full-time groups of student teachers were equivalent, one should still ask the question: Is there a subtle or non-subtle built-in bias present in the attitudes measure which can explain differences in favor of the full-time group?

Finally, we have an example of a "two-matched-groups" type of experiment which compared students doing student teaching at the junior level versus the group of students doing their student teaching at the senior level. Various criteria were used for the comparison of attitudes, aptitudes, and achievement in science and mathematics with no significant differences being announced. Here again the usual criticism can be leveled as regards the comparability of the two groups, since they were non-randomly assigned to the "experimenal" or the "control" treatment. Thus, in none of the experimental studies was there an example of a study which could not be criticized on the basis of inadequateness of experimental design.

Instruction and Field Experience

In contra-distinction to previous sections, this section can be characterized by the predominant usage of the experimental method. In some instances, the single group pre-post test procedure was employed. In some cases intact non-randomly assigned subjects were administered treatments, but in many of the experiments subjects were randomly assigned to treatment groups, experimental and statistical controls were invoked and criterion variables were carefully chosen. Some of the survey studies of this section were concerned with citing relationships and/or predicting criteria from other variables and a few researches were devoted to the task of building instruments for use in the teacher education process.

The types of problems investigated within the area of teacher education were many and varied, such that any effective classification of studies in content areas would be difficult, if at all possible. However, most of the studies can be viewed as investigations of various approaches in the preparation of teachers; that is, effects of instructional methods, laboratory experiences and so on, with a fair amount of study put to classroom observation.

It would be impossible to comment specifically on each of the various studies in this section. However, some comment concerning the general methodology employed can be made. The great majority of the studies were experimental researches in which treatments, usually various methods of conducting pre-service teacher education were applied to subjects, usually teacher education students, who were thereafter observed on the basis of their responses to various types of measuring devices. How the treatments or methods of instruction were chosen for study is not always clear but with few exceptions it appeared that the choice of treatment was made on grounds other than obtaining information for the edification of teacher education. Remarks which have been made by Travers and others (5) seem to apply at this point. His view has been that although there may be no one optimal teaching method or narrow set of methods, the investigation of teaching methods, if it is to be of informative value, should be motivated in some reasonably defined way by basic psychological principles, such as learning theory and personality theory.

In at least two studies the motivation for the choice of the methods of instruction are specified and appear to stem from either previous research findings, as in the case of Amidon, or in the use of principles of learning in teaching in the analysis of self-behavior as a definition of a method itself, as is noticed in Hough and Amidon. Other teaching methods were defined and studied because of an interest in the methods themselves and for no other reason. It is difficult to criticize endeavors of the latter sort, since it is clear that in order for understanding to be produced in teacher education one will be interested in all types of information on many different topics. It would seem, however, that a somewhat tighter structure as regards the direction in which understanding develops will be helpful in the total endeavor.

In the assignment of subjects to treatments or the experimental design, as it is sometimes called, it is quickly noticed that only the simplest of experimental designs have been utilized in this section. This is to say that almost no other design, except for the single factor two-group design, has been employed. There are many investigators and methodologists who do indeed prefer extremely simple design, at least until some knowledge is built up in a field. These are, generally speaking, unifactor designs investigating a panel of variables separately, one at a time.

However, there is definitely another school which exists and in which the point of view is that univariate investigation is entirely too unrewarding. Moreover, it is asserted that univariate approach presents a biased point of view, since in reality multifactor, multivariate frames are more realistically descriptive of the real world. I personally prefer univariate simplicity at the start of a study series, with an eye to the multivariate approach later on. Few individuals would argue the point that one should employ a design only if an analysis of it yields interpretable information.

A somewhat more involved design which might have been employed in many of the investigations of this section would have utilized a pre-stratification of experimental subjects along various dimensions of interest before randomization of subjects to treatment groups was made. This approach, of course, is not much more involved than that which was used and perhaps might provide information concerning the way in which treatments operate together with subject characteristics.

A word can at this point be said about the choosing of experimental subjects. In almost every case observed, the experimental subjects, whether assigned to treatment randomly or not, were chosen from an institution or a narrowly defined supply source. This procedure, of course, leading to much narrower generality, is utilized because of the availability of subjects. One solution to the problem of generality might be that of the commonly used idea of replication of the experiment in another context in order to broaden the generalization basis.

One observation should be made concerning the analysis of the experimental findings. It was disturbing to me that analyses were generally made on arithmetic means with little attention being paid to other descriptive measures such as variances, indices of shape of distribution, percentage of overlap and so on. It would seem that some other descriptive indices would bear a fair amount of impact on future analyses.

Finally, a strong recommendation should be made for clarification of how the "teacher effect" was handled in many of the experiments and surveys reported. It is likely, but not apparent, that in some experiments teacher effects and treatment effect were irretrievably confounded.

Student Personnel

The summaries in this subdivision of the research reviewed indicate a pre-disposition to (a) the survey approach in which questionnaires and instruments of various kinds were used to gather information and (b) relationship studies in which variables of all sorts on students in teacher education programs were inspected for the discovery of relationships and possible predictivity. There were far fewer comparative surveys in which groups of intact individuals were contrasted on different variables. Extremely few experimental studies were reported.

The questionnaire approach typically sought to obtain information on student personnel programs and reactions of student personnel to the profession. In general, however, the type of information obtained seemed to be of a somewhat more incisive, relevant and useful sort than has been previously described in the first sections. The prediction studies considered herein were in general concerned with the prediction of teaching success through instructor rating, supervisory rating, observer rating and so on by means of predictor variables, such as grades, achievement test scores, ability and aptitude test scores, faculty ratings and personality variables. The results of the various attempts at prediction seem to indicate that whether or not "teacher effectiveness" can be predicted efficiently depends on the predictor variables, that which is being used as a measure of teaching effectiveness and the sort of subject groups one considers.

In the relationship studies, or correlation studies, a fair degree of work was done in relating various measures, such as attitudes and personality characteristics, either before or during the teacher education process. There were some attempts at building measuring instruments, e.g., interesting studies were conducted by Lang in building a motive for teaching scale and by Stern and Masling concerned with career motivation for teaching. Obviously, much work needs to be done on these scales and others concerned in the research.

As a sort of substitute for the experimental method, it was noted that some comparative surveys were run, the comparisons being based on different groups of student teachers, for example, such as elementary and secondary, and the comparisons being made on variables such as attitudes and personality measures.

The work done in prediction and relationship, of which the comparative surveys were a part, fulfills in part a need for information concerning the inter-relationships of various variables in the area of student personnel. One can utilize predictive devices on variables of all sorts even if the criterion variable is not that which one would have chosen for himself, for I believe in the unfeasibility of an ultimate criterion of teacher effectiveness. Personally, I would have preferred to have seen more observational schedules studies, such as those due to Mitzel and Medley, Ryans and Flanders. However, I consider valuable the information which is produced by means of correlation analysis as long as one understands that this information produces relationships and can in doing so lead us to the consideration of basic understandings in the field of applied and theoretical teacher education. In all the relationship studies reported, methodology has been of a rather classical sort, namely, the usage of correlation coefficients, multiple regression equations and factor analysis to a smaller degree. There are some different, if not newer techniques, which have recently been held up as of possible value.

The almost complete absence of experimental research (only Edson and Wilk appear to have run a true experiment) indicates that either investigators in the student personnel field do not in general want to manipulate experimentally treatment factors or the research reported is not representative. Inquires of colleagues would seem to support the former conclusion.

Teachers and the Profession of Teaching

The researches in this last section have utilized one of three approaches in order to survey different facets of teachers in-service. One approach has been that of obtaining relationships between given measures of teacher characterisitics, such as teacher creativeness, attitudes, temperaments, competence and effectiveness. Another group of studies was concerned with investigating the degree of relationship between various variables but by means of the comparative groups method in which intact groups with desirable characteristics were compared with respect to the certain variables of interest. Finally, there was a group of studies which was concerned with obtaining information on in-service teachers by means of questionnaire survey methodology. Here teachers were followed up in an effort to investigate their opinions as regards what was lacking in their teacher education programs, what difficulties they encountered and items of information associated with employment status.

A basic question which can be asked of all the relationship studies in this and other sections is again "exactly what meaning can be attached to the various relationships cited in the absence of reliability and validity information." For example, the study by Bond on the relationship between creativity and teacher competence, which would seem to me to provide promise for future investigation, can be questioned concerning the definition of creativity in order for the true impact of the study to be assessed. A different but related remark can be made in the McGowan study, for here it is not at all clear how the various items of training data were combined in order to arrive at the combined pool referred to and similarly for the field rating concensus. It is clear that an inoptimal combination of either the various pieces of training data or the various pieces of field rating data might operate oddly when these ratings are related to other variables. In many of the relationship studies, it would seem that the basic item of concern would have been to obtain the factorial content of the variables involved. In the questionnaire survey studies, the usual criticisms once again apply.

Some overall reactions and summarizations

In re-reading my reactions to the various individual sections of the research summaries, I have been forced to criticize my own remarks as follows:

(a) My reactions appear to be (and indeed are) those of an outsider reacting to a broad class of specific researches of a rather heterogeneous nature.

(b) My reactions have been, for various reasons, on the whole rather general sorts of reactions, many times not sufficiently incisive and many times of a somewhat negative flavor.

There are at least two possibilities open to me now. One is to start over again and rewrite completely. Another is to try to summarize and to present those salient points which would seem to have some constructive value. I have chosen to do the latter, for obvious reasons, in the following part of this paper. In an effort to find a a point of departure, I have asked myself the following question: "As a result of having read the research summaries and my own reactions to these summaries, would it be possible for me now to specify the research direction I would take in the field of teacher education, given adequate resources and time, in order to obtain optimal processes so as to produce maximal pay-off in product?" Thus far, I am afraid I have been unable to attain closure, on this question. Hopefully, other participants in this conference will be able to offer much along these lines. It is true, however, that each individual investigator will have to answer this question or a similar one for himself at one time or another. It is also entirely possible, even desirable, that a great number of contrasting approaches will have to be taken in order for progress to be made in attainment of any basic knowledge in the area.

In any event, I feel it would be extremely helpful if some guidance in structure or structures to the total research venture could be provided. For my own edification, I have gone to Gages' paradigms (5) and have found them quite useful, providing a guidance system to be used in lieu of a theory or set of theories. With these basics left in a rather incomplete state, I would like to consider the total set of researches to which I have previously reacted.

A well known fundamental item which must be considered in research at any level is that of the panel of variates to be employed, given certain purposes for their employment. Evidences of researchers paying attention to this fact were noted in the research dealing with instrument construction, investigations of inter-rater reliability, prediction studies, correlation studies and other studies on relationships. In many of these researches information is obtainable which may be used to assess validity and in some cases reliability. However, except for these relationship studies, the validity and reliability of the many measuring devices was not strongly considered. For example, in very few of the experimental studies is there a mention of a concern of the investigator of the validity and reliability problem. The new concepts of Bronbach (4) on reliability and the work of Harris and Kaiser (6) on factorial validity, would seem to me to be quite applicable to these problems.

It was encouraging to discover that in several instances research activity was being directed to the problem of constructing new measuring instruments, and in many of these research efforts the problems of validity and reliability were being considered deeply. Validity and reliability problems were particularly noted in the questionnaire survey studies. Non-respondent bias, the lack of reliability and validity evidence and the actual meaning of respondent replies under the possible dependence between respondent and the sponsoring agency of the questionnaire make interpretation difficult. All of these basic factors, it would seem, would have to be considered before any analysis or interpretation of the results obtained would have meaning. Again, some researchers were fiercely concerned with these fundamental problems, others were not.

In the matter of design of survey and experiment, it was previously noted that only the most simple of survey and experimental designs had been utilized. In many circumstances the use of a more complicated survey design or experimental design would have brought much more information concerning the relationships of certain primary factors with other factors which have been shown by previous research not to be independent. Thus in both survey and experiment, the stratification of teachers on variables such as achievement, attitude, and interest offers a mechanism by which a more precise analysis can be made. At the same time, if the stratification variable is carefully chosen it almost always provides a factor which along with the prime factors being investigated is of interest in itself. I am not suggesting that one should complicate a design for a vacuous problem. What I am saying is that factors besides those investigated in many of the previous studies would have been well brought into the study in order to explain pertinent interrelationships.

Another methodological item which seemed prominently lacking was a consideration of the sequential, or longitudinal, effect of treatment in the case of experiment and of response in the case of survey. This has resulted in results which are extremely specific as regards the time point at which they were taken. Very few studies were actually seriously concerned with tracking the response of teachers or student teachers over an extened period of time. It is true that in certain cases follow-up information and retention data were obtained, but these observations were generally taken at a single point in time again. Perhaps one of the over-riding reasons for this gap of information lied in the difficulty with which the subjects may be followed and the constant problem of drop-out of subjects in the profession of teaching. In any event, it would seem to me that the sequential aspect of subject response is a problem which must sooner or later be tackled and on which information must be obtained.

Another disturbing effect which is constantly present in all sorts of experimental studies in which classes of teachers are being considered is that of the intact nature of the class and the concomitant teacher effect problem. For example, in many of the methods studies cited in the section on Instruction and Field Experiences, the teacher effect was completely confounded with the treatment effect since different teachers were used for different treatments. On the other hand, in certain cases where the teacher himself applied several treatments, the unknown effect of treatment error due to differential treatment application could vitiate most of the results of studies of this sort.

It is not clear in many methods studies the degree to which the novelty of any experimental or new method affects the experimental results, and in addition, there is the confusion effect of the new treatment in the case where the teacher is not completely trained in its usage. All of these disturbing points of view will support the contention that methods studies will have to be designed quite carefully in order that any of the information which results can be viewed as being of basic importance. One solution which has been offered by some methodologists is to assign teacher-class combinations randomly to experimental treatments. This procedure does pull one of the case in which treatments and teachers are confounded and also dissipates to some degree the potentiality of halo effect when the same teacher applies more than one teaching method. However, in this procedure the basic unit of investigation for use in analysis is the class. It is apparent that here one will need more than just a few classes each with a given number of students.

If one considers the over-all design of research in this area, one is struck by the fact that almost invariably a study is either experimental or is concerned with relationships. These two points of view have very specific merits, each by itself, but it has been pointed out by Cronbach that many research questions can be answered much more informatively if one affects a marriage between the two points of view. Thus experimental research could be used in order to obtain information concerning relationships among different variables and simultaneously to investigate the causative nature of these relationships among treatments. This procedure, of course, requests an entry into the area of multivariate experimentation.

Another item on which I have commented previously but which needs reiteration is that of the generalizability of the various results cited in the present research summary. This, I would say, is perhaps one of the most forceful criticisms which could be leveled at the totality of research findings. The researches seem to have been done in very specific subjects under extremely unique circumstances, such that any generalization to subjects not in the experiments and surveys themselves would have to be made with a fair amount of cross-checking as regards the comparable nature of subject characteristics. It is understandable that many of the researches would not have been done unless subjects were found to be available. This fact is not unique to the field of teacher education and exists in one sort or another in almost every field of research. What does seem to be missing is an almost complete lack of replication of many of the experimental or survey procedures described in the summaries. Except in very few instances (the work done on comparative classroom observation is one exception) the studies are unique pieces of work completely unreplicated in any form. Of course in some cases replication would not have been advisable since the content of the research itself would have been judged by others to be of minimal interest. However, there are some extremely interesting experimental studies, which as far as I am concerned would bear replication, modification, and extended research.

Finally, as far as design goes, I was struck by the extreme care with which some investigators specified treatment, invoked very carefully the principles of randomization, utilized meticulous controls, and defined meaningful and informative criterion variables. However, it was observed that noother work was done in this area, nor were the experiments replicated. Perhaps with more resources available to these investigators, long-term projects in which various aspects of the research can be investigated over a period of time and over a broad base of generality might be provided.

Now a few comments are in order as regards the analysis of experimental and survey findings. As has already been indicated, it would appear that in the future researchers would proceed from extremely simple, albeit adequate, univariate designs to more complex multivariate designs and accompanying analyses. The discouraging thing in the field of multivariate analysis seems to be the perennial problem of interpretation of results. However, books like Cooley and Lohnes (3) and other persons interested in the field of multivariate analysis will in time make interpretation simpler. One hopes that recent work bearing on the problem of sequential experimentation and response-surface methodology will be used in the field of teacher education to yield deeper answers to better questions.

The actual physical act of analyzing experimental and survey data is being simplified and de-laborized by means of computer facilities. For example, "almost exact" tests of hypothesis and estimation procedures can now be provided for a wide class of experimental designs in which no assumptions are made, through a computer program by Baker and Collier (1). Data processing seems to be no problem, rather, the problem seems to be the problem itself. In the area of prediction and relationship work by Ward (9) and Bottenberg (2) have produced regression analysis procedures particularly useful in educational circumstances. Again, the work of Cronbach in reliability and Harris and Kaiser in factor analysis will provide much needed new technique in psychometrics.

There is a relatively new theme of dissatisfaction in the area of the interpretation of experimental and survey results which has motivated many theoretical statisticians to utilize a concept known as Bayes' Rule and thereby to alter considerably the way in which statistical inferences are made. It is to be expected that these new approaches will offer new tools which can be helpful in the interpretation of research results. A recent application of the use of Bayesian inference has been made in the field of education by Meyer (8) to the decision procedures of a school superintendent.

The remarks above on new developments in statistical analysis and interpretation are, of course, entirely incomplete and are given only with the idea of indicating that researches in these various fields are indeed concerned with the interpretation of research data. It is my personal feeling that the existing analysis tools are probably sufficient to cope with almost all of the problems produced by researchers in the field of teacher education. Furthermore, I believe that true advances in obtaining scientific information in this field will probably not come through new techniques for the analysis of research data nor through remarks of methodologists such as those above. Rather, they will come from investigators who are knowledgeable and adept with fertile minds and different points of view and who have a heavy dedication and interest in research in the area of teacher education. The fact that the previous research summaries of Cyphert's are violently disperse and heterogeneous as regards problem, approach, and basic frame would seem to indicate that unless there is a restructuring of the area such that a concerted attack on problems of basic concern is made, real progress and fundamental information will not be soon attained. The real strengths in the research methodology used heretofore will be found to lie in the motivational value for future research.

References

1. Baker, F. B. & Collier, R. O. Manual for analysis of experimental designs by means of randomization, Preliminary Mimeo Manual, 1964.

2. Bottenberg, R. A. An iterative technique for clustering criteria which retains optimum predictive efficiency. Lackland AFB, Texas, Personnel Laboratory, WADD, 1962.

3. Cooley, W. W. & Lohnes, P. R. Multivariate Procedures for the Behavioral Sciences. Wiley & Sons, New York, 1962.

4. Cronbach, L. J., et. al. Theory of generalizability: a liberalization of reliability theory. Mimeo pre-publication copy, 1963.

5. Gage, N. L. (ed.) Handbook of Research on Teaching. Rank McNally & Co., Chicago, 1963.

6. Harris, C. W. & Kaiser, H. F. A new approach to rotation in factor analysis. Paper presented at AERA meetings, Chicago, 1964.

7. Kaplan, Abraham. The Conduct of Inquiry. Chandler Publishing Company, San Francisco, 1964.

8. Meyer, D. L. The Bayesian school superintendent. Paper presented at AERA meetings, Chicago, 1964.

9. Ward, Joe H. Jr. Higher arctical groupings to maximize pay-off. Lackland AFB, Texas, Personnel Laboratory, WADD, 1961.

IMPACT OF THE RESEARCH UPON THE PRACTICE OF TEACHER EDUCATION

L. D. Haskew
The University of Texas

This paper is prepared to specifications necessitated by the structure of a conference. As a component of the strategy of that conference, it is charged to (1) confine itself to research "circumscribed traditionally as research in teacher education"; (2) restrict its span of attention to such research occurring recently; and (3) offer judgments -- not proof -- on the impact of that research upon practice in teacher education. It is designated as an analysis, from which inferences and projections may flow in the second phase of the conferences.

Presentation is made in four sections. First, limitations imposed by the assigned role and by the task itself are made explicit. Second, the phenomenon of impact by research upon collegiate professional education is examined. Third, judgmental observations are offered on the impact upon practice in teacher education made by the research under examination in this conference. Finally, a subjective critique of the research-practice syndrome is offered.

LIMITATIONS IMPOSED

1. By the conference definition of "research in teacher education." Conference documents state that research examined in Part One of the conference shall be limited to "the traditional boundaries of research in teacher education -- (1) historical development, scope, functions and objectives of teacher education; (2) organization and administration

of teacher education; (3) college faculty and staff personnel; (4) curriculum offerings in teacher education institutions; (5) instruction and field experience in teacher education programs; (6) student personnel in teacher education; and (7) teacher education and the profession of teaching." The summarizing document addresses itself to these rubrics. While Part Two of the conference is addressed to critical examination of this traditional circumscription, the present paper must accept it.

This means that the major area of teacher education must be ignored, the area devoted to selecting, organizing and imparting content within the academic disciplines. This content furnishes general education and academic specialization for prospective and for practicing teachers; from sixty to eighty percent of a collegiate program for educating teachers is explicitly disciplinary in structure. Research which affects academic disciplines affects teacher education. For the present discussion, excluding research related to academic disciplines is particularly misleading. Most responsive activity in teacher education in the period 1958-1963 was to what research has done to the structure and content of mathematics, the sciences, and language. At the in-service level, such activity almost completely dominated the scene; its prolixity was phenomenal. Even within the confines of colleges and graduate schools, it accounted for the majority of curriculum changes made and for a large proportion of the doctoral studies undertaken.

Therefore, two points must be kept in mind. The volume of *bona fide* research pertinent to teacher education is much larger and more definitive than this paper would seem to indicate. Second, the impact of disciplined-based research and reconstruction upon practices in teacher education during the past five years has been immediate and significant. To this, further reference will be made.

2. By the task assigned. Obviously, the only procedure practically available to the author of this paper is that of speculation. Demonstration that one phenomenon in the social realm has impact upon one other phenomenon is difficult enough and seldom actually accomplished. When scores of researches and thousands of practices in teacher education are viewed, only a fool would claim measurable validity for cause-effect relations he surmises to exist.

3. By consideration of teacher education alone. Examination of the research-practice connections in any single branch of professional education can lead to tacit evaluations which are derogatory. Inevitably, it is found that little connection exists. Hence, the mind runs, something must be wrong with either the research or the education, or both. Against an arbitrary standard, this may be true. But when the same state of affairs is found to exist in all varieties of professional education, one questions the standard itself. To be explicit, the same research-practice discontinuity exists in physician education, engineer education, lawyer education, manager education, and teacher education. To label the examined one as recalcitrant, inept, or even insufficient is misleading. The question, "What is the impact of research upon practice in teacher education?" deserves a succeeding question before evaluation is undertaken, namely, "Compared to what?" The problem of connecting research with educational practice is a generic one, not solved by scapegoating.

With these limitations, presentation proceeds. The next subject is that of impact as a concept.

NATURE OF IMPACT

To seek evidence of impact, first necessity is to arrive at some understanding of the phenomenon of impact itself. When research has impact upon practice, what happens?

First, let us note that change in practice is not an inevitable criterion for the existence of impact. Research findings may support continuation of the status quo, and often do. Or, they may fail to show any significant advantages for the variation being tested. Or, they may show great defects in an existing practice, but offer no evidence on what would succeed better. Or, the results of research may be subject to two autithetical interpretations -- as witness the findings connected with phonetic approaches to teaching of reading. In all these cases, the "impact" of research may be "no change." How does one distinguish "impact" in such cases from just plain inertia? Yet, to assume that there is no impact simply because there is no change is fallacious.

Second, research may account for singleton changes in practice which fail to spread beyond a single institution for long periods of time. One thinks immediately of the rather considerable changes wrought in practices for educating pre-service teachers at The University of Minnesota during the last few years, directly traceable to researches conducted there. These changes have not been imitated widely; indeed, they are not universally present on the Minnesota campus. Scores of other examples of this character could be cited, ranging from the practice of a single instructor in a single course to a cooperative project involving several institutions but largely unknown elsewhere. What spread is necessary for there to be impact?

Third, research is often introduced directly into method and content without visible manifestations in what is typically called practice. Witness the transformations wrought recently in the content of personality theory ordinarily studied by prospective school counselors, drawn from results of research. Or, the shifts in many educational psychology courses toward study of researches and toward objectives of research-mindedness. Few philosophy of education courses fail to reflect in content and organization the researches of analytical philosophers. The literature, if not the rather nebulous supporting research, on concept-formation is commonly present in undergraduate and graduate offerings labeled methods of instruction. Here we have illustrated a considerable impact by transliteration, often overlooked. Or, is it impact? Changing the content may not change outcomes; what does constitute impact upon practice?

A fourth type of occurrence presumably generated by research is illustrated by current widespread efforts to foster divergent mind-sets as opposed to convergent patterns of thinking.[1] The research findings dealing with these concepts are increasingly carried to the level of teaching action by at least semi-promotional means and by interpretations and applications produced by a middleman. Thus, we get advocacy of a practice, or set of practices, which may have relatively little grounding in the triggering research; those adopting the advocated practice seldom know the research itself. In earlier days, for example, the very limited research on authoritarian versus permissive group climates was used as the original reference point for a great movement. It was implemented by textbook writers, college professors, supervisors of instruction, workshop directors, and others. It had significant effects upon the practice of teacher education but the applications bore only incidental similarity to legitimate deductions from the research itself. The risk that research findings may be mis-handled is not the point here. The point is that actual nature of impact at the practice level is determined frequently by intervening actions of promotional character.

---

[1] See, for example, Hilda Taba, "Teaching Strategy and Learning," California Journal for Instructional Improvement, December, 1963, 116-24.

Fifth, much of the research under examination in this conference should not have any change-producing impact upon the practices in professional education for teachers. Some of it produced new content for the curriculum, but that does not necessitate a change in curriculum practice. A high proportion of it resulted in findings which are non-germane to practice, although germane to other matters. Some of it -- how much is a matter of debate -- merely pools opinions or describes the current scene, and gives no real guidance to those concerned with improvement of professional education. The situation in these respects for teacher education differs insignificantly from that for other endeavors in professional education, emphasizing the point that sparsity of impact is a function not alone of the research itself but also of the selectivity exercised by a very narrow target.

Sixth, it must be understood that the natural effect of research is not upon practice but upon further research. Typically, impact upon practice comes at the end of a rather long chain reaction. Research usually produces instruments, methodologies, tendential discoveries, verified partial information, revisions, and compensations for error long before it produces clues for practice. Thus the significance of impact cannot be measured exclusively against a scale of mutations wrought in practice. This conference examines a proposition that research can thrust more directly at practice. But, it should not overlook the equally-valuable impact of research upon research.

Seventh, frequently the theory developed to direct research influences practice more than do the findings. Reinforcement theory of learning, for example, is currently followed in many curriculum innovations in teacher education to a degree far beyond that justified by the findings reported from applications of this theoretical framework. In graduate programs for school administrators one witnesses rapid adoption for curriculum exploitation of theoretical constructs hardly tested at all by research pursuant thereto. Yet, it is research as an undertaking which produces theory and if this investigative tool is employed for practicum objects, research has "produced" an impact. Charles J. Brauner has recently coined a highly descriptive term, "the triumph of rhetoric: theory as talk" which is all too applicable to the past course of teacher education as an investigative discipline.[2] If research can substitute conceptual theory for talk to even a slight degree, perhaps this is a valuable impact.

Finally, and perhaps most significant of all, what has impact upon practice is seldom research itself but applications of research findings -- and there is a major, inspired difference between the two. To be exact it is necessary to add that even inspired, proven applications usually require vigorous merchandising before they change practice. The nature and extent of differences in the persons who undertake student teaching is the subject of recent research, for example. Differences have been found, descriptive instruments have been invented and verified. But, applications of these findings are neither established nor verified. Hence, the careless may dub such research as sterile, useless, insignificant. They overlook the fact that in many colleges applications are being sought for. Research which stimulates search for applications is having impact, in other words, although practice has not yet felt its influence. It might be well to ask three questions if one wishes to measure the vitality and influence of research endeavors in an echelon of professional education. First, to what extent is the research producing findings which apparently trigger efforts to invent applications? Second, how prevalent are experimental attempts to produce inventions, develop applications? Third, is the research producing both methodology and atmosphere which lead to genuine testing of the application before it is promoted for practice?

---

[2] Charles J. Brauner, American Educational Theory. Prentice-Hall, 1964, pp. 152-74.

To summarize, it is proposed that the phenomenon of impact is far from the analog of an inter-continental ballistic missle which once successfully launched strikes with revolutionizing force the target chosen in advance. The opposite analog -- that of shooting arrows in the air to come to earth no one knows where -- has not been espoused either. Instead, it has been posited that research has several targets, that its methods of impact are highly varied, and that evidences of impact are to be sought in multiple dimensions.

Also, another deliberate effort has been written between the lines of this section -- an effort to counter the all-too-prevalent tendency to scapegoat the quality of research in teacher education. The problem of impact upon the practice of professional education is a tortuous one and the quality of research is only one tiny facet of a solution, in this author's judgment. For those who think teacher education stands alone in its quest for significant research endeavors, may I recommend perusal of "The Proceedings of the Second Annual Conference on Research in Medical Education," the February, 1964 issue of The Journal of Medical Education?

MANIFESTATIONS OF IMPACT

Turning now to the recent research summarized and reported to this conference, judgmental observations are offered upon the impact of that research on the current practice of teacher education in the United States. Four general, cross-cutting observations are made first. Brief notes on each of the categories of research employed in the conference report then follow.

Research activity as an accompaniment of teacher education has burgeoned during the five years under examination. While absolutely small and in comparison with other fields of research endeavor almost laughably inadequate in volume, research as a normal activity of the college faculty member in teacher education has in all probability increased more since 1958 than in the twenty years preceding. Obviously, the chief cause has been the availability of Federal funds through the Cooperative Research Program of the United States Office of Education, Title VII of the National Defense Education Act, and the National Institutes of Health. Regardless of cause, however, the pertinent point for the present discussion is that the practice of teacher education is increasingly conducted in tandem with research endeavors going forward on the same campus. Sampling observations offer a hint that there has been a notable amount of cross-feeding between the research itself and the collegiate offerings for students. This is in the form of approach, emphasis and atmosphere in courses, and quite frequently in changed content. Students are reading and reporting upon research studies, conducting investigations as normal assignments, encountering units or even whole courses on research methodology. Course content is being changed, if not by the findings certainly by the theory of a faculty member's investigations. The work of Jackson and Getzels at Chicago, of Hughes at Utah, of Flanders at Michigan, of "the team" at Minnesota, and of many others is obviously reflected in the content and structure of offerings for graduates and undergraduates on those campuses. Investigations such as the Mental Health in Teacher Education Project at Texas have occasioned some far-reaching changes in the local structure for teacher education. Granting that such manifestations of impact are chiefly local, still there are considerable feed-outs chiefly in the form of migration of persons. Research in philosophical theory undertaken at Stanford makes its appearance in courses at Ohio State; in vocational choice at Harvard shows up in in-service offerings at Emory; in teacher behavior at the City University of New York is transplanted to the University of South Florida. As a parenthesis, I point out that citation of names and places is random sampling. As further evidence of research-permeation if not influence, it should be noted not only that the compendium, Handbook of Research on Teaching could be prepared but that it was brought out by a commercial publisher and that its use as a reference work in graduate and undergraduate courses is already comparatively phenomenal. Witness also the September, 1963 issue of The Journal of Teacher Education devoted to current research on classroom behavior of teachers, remarkable for the respectability of its contents but more remarkable in its widespread use as class material. Documentation must cease at this point, but a considerable volume of evidence seems to warrant a judgment that increase in research activity has been accompanied by increased introduction of investigative flavors into the curriculum fare of those who pursue education as teachers.

The period may have demonstrated also that a little research is a dangerous thing. The three great modifications made in teacher education as defined in this conference are (1) the "experimental" total program undertaken with Ford Foundation grants, (2) the usage of television in connection with instruction of prospective and in-service teachers, and (3) the "concept" reformulation of academic disciplines with an accompanying stress upon disciplinary organization of the school curriculum. Neither modification is yet the norm of practice, but it is clear that they are the shaping influences upon such reform as may be transpiring in teacher education as a whole. Note that each is a venture in the invention of applications. Prominent in the Ford Foundation grant-supported programs, but decidedly visible in the others, is the assumption that "what is needed is already demonstrated; now ways to apply it must be found (or sold?)." One would like to cite this as an example of impact by research, comparable to the mammoth application of effort generated by research on polio vaccines. Certainly, sponsors make considerable attribution to "what research has shown." The troublesome feature to this reviewer, however, is that he cannot locate the research referents. He can locate tremendous promotional enthusiasm reminiscent of the evangelism which sold the project method a few decades ago and child study in the forties. Neither can he locate much structure for testing and evaluating the so-called experimental search for applications. Perceived is almost no witnessing to any theory but talk. Therefore, he concludes that all the research in teacher education has had little or no impact upon the traditional means by which the practice of teacher education is influenced in this country, namely, by using the mantle of fictitious research to bedeck the otherwise frank espousal of what somebody thinks would be good. This is not carping criticism, but observation. The research mantle was used by the protagonists of student teaching, by those who espoused the Prescott-style of child study, by those who sold restrictive selection of students for teacher preparation. Responses were surrounded with precious little testing or evaluation. Teacher education kept some, discarded others but with no evidence either way. In 1958-1963 the same course was dominant -- placing big bets on horses at the instance of knowing tipsters, but making no plans to even stay around to learn how the race comes out.

A third general observation is that any composite description of teacher education practice written in 1944 would require few revisions for the sake of accuracy in 1964. In short, not anything -- including research -- has had any transcendental impact. Recall, however, that the same could be stated truthfully for any branch of professional education and for higher education generally. As pointed out earlier, this manifestation may be a sort of impact-in-reverse; research has indicated "no significant difference in results for the two methods compared," so why change? It may also demonstrate that the importance of the style of practice in teacher education is vastly over-rated. In fact, this observer submits that the sum total of all the research on processes of higher education supports only one hypothesis -- that the mechanical and imitatable processes are very minor factors indeed in what students learn because they attend colleges or universities. Observed inertia or even alleged mutations in practice may be totally miscast as measures of the change in teacher education if the wrong artifacts are being observed. Things like observation-before-teaching versus observation-after-teaching are what is meant usually by "practices," but these are mere schedule adjustments which tell nothing about the real acts of preparing teachers. One finds little difference in the catalog descriptions of the undergraduate teacher education program at Iowa State College in 1953 and in 1963, but this observer thinks there are some substantive modifications in what students encounter. The connection between brands of content thrown at students (remember the cultural anthropology that was going to make classrooms become distilleries of human understanding?) have tenuous connections indeed, according to research, with the classroom behaviors of those students when they become teachers. In brief, simple recounting that (1) research has occurred and (2) significant changes in mechanical practices have not occurred is not to demonstrate an hiatus between research and the education of teachers. Such reports may indicate, instead, that research is looking for an Aladdin's lamp which does not exist -- namely a programmatic solution to an irrational problem -- or that one is looking in the wrong places for evidences of the only types of impact significantly available to research findings.

A fourth and final general observation is that teacher educators -- perhaps as distinguished from teacher education? -- are manifesting increased preoccupation with theory as construct. This, I judge, is directly attributable to efforts to break into big-time company with research in education. Theory as a design dictating the warp and woof of research is the mark of scientific, and to some degree philosophic, endeavor. But, as was pointed out earlier, theory-for-research is rather quickly transliterated into theory-for-training. Witness the resurgence of Piaget's theory of cognitive process in organizing courses in instruction as well as in psychology, or the widespread adoption of Bruner's formulation, or the prevalence of reference to one variety or another of systems theory. A Cooperative Research Branch Project titled Thinking in Elementary School Children[3] is a case example of an adventure in theory becoming an experiment in theory-based in-service education for teachers aimed at that perpetual Holy Grail - command of a master strategy for performing as a teacher. Some members of the panel of consultants for this conference are probably engaged in their teacher-educator roles as expositors of a constructed theory in ordering the training of their students to teach. Whether teacher education is being improved by such transfers from inquiry to training is not judged here; reported is an observation that evidences of impact by theory do exist.

Now this report proceeds to *seriatim* observations on the impact of the particular research summarized for this conference in the report by Cyphert and Spaights made available to participants. Section headings in that report will be followed.

---

[3] Project 1574, Hilda Taba, Director

Historical Development, Scope, Functions and Objectives. Perhaps no period has witnessed more agonizing about the scope, functions, and objectives of teacher education than the past five years. The items reported as research, however, appear to be artifacts of the upheaval, not influences upon it. Strangely missing from the items are Brauner's American Educational Theory; the 63rd Yearbook, Part II, of the National Society for the Study of Education, Behavioral Science and Educational Administration; and Cremin's The Transformation of the School -- all monumental, creative studies with considerable potential for influencing teacher education. Cremin's formulation is having influence, I am told. The other two are too recent for their weight to be traced. Some of the publications cited undoubtedly merit consideration although this reader found great difficulty in connecting them with a conference on research in any field. They do afford an opportunity, however, for an observation that the impact of one-man proposals for teacher education -- in which the present observer has been prolific -- is chiefly upon the printing industry and the convention circuit.

Organization and Administration. Apparently nothing gets organized and administered except student teaching. If the "research" is to be of the character indicated in the items reported, however, the more that can be eliminated from such scrutiny, the better. To my knowledge, such normative studies of student teaching have been going on for twenty years and the findings vary infinitesimally. If the studies affect practice, the studies do not show it. But, strangely enough, such studies frequently have some local effect by upholding what the Dean was trying to convince the President (or the local superintendent) on anyhow.

College Faculty and Staff Personnel. I must go beyond the cited studies here. One finds considerable local college activity constellating around the role perceptions of college teachers. Some of this apparently has been triggered by studies connected with televised instruction, some by role-theory investigations of classroom transactions in which the college supervisor of student-teachers was one role player, some by projects dealing with mental health, and by genetic studies of attitudes. Certainly, also, one must not overlook the tensions and actual changes in faculty orientation introduced on university campuses particularly by the addition of "researcher" to the normal expectations for faculty performance. The composition of university faculties in Education underwent considerable evolution between 1958 and 1963, in the direction of acquiring potential productive scholars; positions in full-time research began to make their appearance; faculty qualifications gravitated toward academic specializations and away from successful practice in elementary and/or secondary schools. How much research had to do with these shifts is impossible to ascertain, but one suspects that as a plasma it is influential.

Additionally, one cannot ignore the considerable ferment now visible in doctoral programs in Education at some of the major universities. One source of the ferment is the envisioned necessity to prepare future faculty members who are also competent research workers. Research itself is throwing little light upon what should be done or how it might be done, but seems to be genetically responsible for appearance of the agitation.

Curriculum Offerings. Reported here are some encouraging and significant studies. No impact by them or similar studies has been found. In a cursory sampling not one of the studies -- nor any other study on the same subject -- was known to department heads or professors queried.

I have the impression, however, that innovations in curriculum offerings have been rather common recently in teacher education. Some of them have been adaptations to projects labeled as experimental or of research nature. Further, perhaps here again the plasma of research is having more influence than concrete studies themselves. Also, one suspects that much more research endeavor focused on curriculum offerings is going forward than is being reported in the literature. A semantic note is also appropriate. The heading is "Curriculum Offerings" not "Curriculum." This eliminates discussion of curriculum modification by transmigration of content which was cited earlier in this paper as a prime means of impact from research.

Instruction and Field Experience. Even cursory examination reveals extensive college activity to change instructional objects, procedures, and the vehicles for conducting the professional sequence for teachers. The activity is markedly of individual enterprise type. Many of the modifications are here today and gone tomorrow. In total, the teaching ventures are as incohate as the research studies reported to this conference. But, some common characteristics of change pervade enough campuses to constitute what may be trends -- expansion of direct observation in classrooms by use of television, introduction of programmed learning materials, reduction in the time-span of contact with children, increased attention to the teaching of subjects as subjects, substitution of internship semesters for the standard student teaching, diagnosis of learning as the basic rationale for field experience, and a few others. Revived attention to the intellectual foundations -- especially philosophy and social psychology -- can be witnessed in the modes of instruction at several institutions. One gets the impression, however, that even the small evidences of commonalty are either (a) fortuitous or (b) responses to the pressures of promotion and the opportunity to secure outside grants.

What has research had to do with this mild agitation in instructional practice? If by research one means the studies on the professional sequence reported in literature, the judgment has to be a flat none. Changes in practice sail into the teeth of the meager research findings as often as they sail with them. The inescapable fact is that the studies reported here are practically unknown to those who make changes. Even if they were known, it is doubtful that they would have noticeable effect, chiefly because so few of them bring knowledge to a level from which applications can be imagined or hypothesized. For fun, this observer tried to find among the items reported five studies which could be added together over a common denominator. He was not ingenious enough so to do. Let him hasten to say that he does know of many congeries of separate investigations which can be added up, but those are not reported here. On the present evidence, therefore, judgment must be recorded that not only is this research without impact upon practice but also that it shows little sign of having impact upon further research.

In fairness to research in the generic and not categorical sense four demurrers to the preceding judgments should be filed. Much instructional practice may be a consequence of local, individual investigations not formally reported; one suspects this is true. Second, the attention of most faculty members engaged in conducting the professional sequence is concentrated on research dealing with instruction in the elementary and secondary schools. Patently, many of the changes reported to this observer are efforts to apply such research to the education of teachers. Third, the judgment registered here would have to be repeated not alone for all forms of professional education in colleges but additionally for instruction in the humanities, the social sciences, and the natural sciences. Fourth, there is significant evidence that at least some of the changes are descendants of research in personality, group dynamics, and other fields unreported in the present category.

Student Personnel. An impressive paradox strikes the observer here. This general area of research -- incompletely illustrated by the significant studies reported to the conference -- appears as the liveliest and most productive in the field of education; the college student as a person and as a citizen in higher education is a significant center of research endeavor. In the practices of higher education, including teacher education, during this period that same student is being progressively disregarded in the mechanical, surface aspects of programmatic provision.

A judgment that such research is futilitarian might be thus justified. I do not think it is. First, much actual teaching does reflect both cognizance of and attempted applications of emerging theories of personality formation. The mechanics provided for attention to student personnel may be travesties on the brave criteria stated but disregarded by NCATE, but individual teachers in the professional sequence are still displaying considerable go-ahead. Second, instrumentation and investigative methodologies such as those reported by Fattu and Peck constitute decided advances, ones increasingly employed in further research. Third, organizational support is steadily building up for such investigations, hinting at least that promotion may be forthcoming. This is important; teacher education is changed by the leaven of research only when someone places the leaven in the lump. Fourth, there are some evidences of a considerable chain-reaction developing with the confluence of new techniques for statistical control of factors, of applications of computers as hardware and as software, and of rather mature paradigms and construct theory.

The foregoing optimistic assessments are incongruent with the array of studies cited in the conference document. Defects in those are not the subject of this particular paper. But, inadequacies in the picture conveyed must be of concern. The restricted scope imposed upon the summarization of research by the original definitions apparently resulted in the exclusion of many directly-pertinent and significant studies. At least, something did. This is not intended as a negative criticism of the summarizers, but as a justification for some of the observations made.

While on the subject of research summarized for the conference, one other observational note may be in order. Even when tradition is the parameter for what is research in teacher education, it is difficult to rationalize almost complete exclusion of studies bearing upon research methodology and instrumentation. Previously stated was a conviction that methodology has as much impact upon practice as do findings. Such paradigms as B. O. Smith's " A Concept of Teaching"[4] are not mentioned; neither are numerous studies dealing with computer applications, systems analysis, fields of influence, interaction analysis, and similar advances in the art of investigation. If the creative challenge in this project is the task of formulating a new strategy for research in teacher education, the methodological dimensions of current inquiry seem to deserve more attention.

Teachers and the Profession of Teaching. There may be some virtue in offering facts to counter myths, allegations, and contentions about the relation of professional education to the field performance of professionals. This virtue was not demonstrated by the studies reported, nor by fifty or sixty others of like content examined. Facts have not swayed opinion. Partially because there are few facts -- even of the most rudimentary accounting nature. But chiefly because few want to listen to facts when opinions are much more spicy. Public impact of the research which could have been reported here has been negligible.

Impact at the college level is equally hard to locate. Yes, there is widespread and yeasty faculty-student activity along a wide front -- curriculum modifications to adapt to what is called the changing role of the teacher, courses and units dealing with internal and external political facts of life in the teaching profession, school-in-community internships, examinations of Leberman's theses about professionalism, and student NEA programs, to give a few examples. Connection between such practice and research is invisible to this observer, however.

---

[4] Teachers College Record 6 (February, 1963), 229-34.

One interesting question does arise. Did Professor Ryans and his report on the Teacher Characteristics Study[5] do more than the modest author ever claimed or anticipated? The cessation (during the period under scrutiny here) of the long line of studies sparked by Charters and Waples is intriguing. For years, an assumption was that teacher education could be made effective by finding out what teachers do (or how they behave, or what characteristics they display) and reading back from there to an instructional program for colleges. This assumption has had long life and many manifestations; in fact, its influence has been rather dominant in research design and in research effort. One man's interpretation of Ryans' report is that it demonstrated conclusively the sterility and impracticality of any such guiding assumption. Studies based on that assumption seem to have vanished from the literature. (The work of Jackson and Getzels, of Flanders, and others of the "teacher behavioral characteristics" echelon seems to me to be based upon an entirely different assumption). If we have a cause-effect phenomenon here, that is impact.

So much for the impact-upon-practice observations. Conclusions bearing upon the research-into-practice syndrome now terminate this presentation.

---

[5] David G. Ryans, Characteristics of Teachers. Washington: American Council on Education, 1960.

RESEARCH AND PRACTICE

Because this assignment sent the author into a much wider foray than he had anticipated, occasion arises to offer some generalizations. Scientific pretense could designate these as "tentative hypotheses arising out of our preliminary investigation." That they are not. They are plain subjective hunches stated as propositions for persuasive purposes.

1. The practice of collegiate professional education is sufficiently different from other "practices" to destroy the fitness of most popular analogs. Research discovery of antibiotics resulting in changes in medical practice is an interesting and encouraging true story in itself; it is sheer myth as a description of what can occur **because of research** devoted to the professional sequences in medical education.

2. What research means for professional education is determined by thousands of individuals (and individualists), not to any appreciable degree by an establishment or even an hegemony of establishments. A corporeal, manipulatable entity does not exist as a referent for teacher education. Strategy based upon a semantic convenience is bound to fail; the true nature of collegiate teacher education is molecular, not organismic.

3. If the phrase "Research and Practice" when applied to professional education is intended to connote a reaction, the conjunction is more important than either variable. It is what brings one into contact with the other that counts, and that process demands telesis of high order.

4. The higher a given piece of research ascends the ladder of scientistic impeccability, the lower is the probability that it will affect the practitioner in professional education. The high priests of research design are sacrificing practice to the god of prestige. It may be a necessary sacrifice at this juncture, but it *is* sacrifice.

5. Conjunctive strategy based upon global master plans for research is simply debilitating escapism and daydreaming. Even if such plans were achievable and executable, impact upon practice is still highly questionable. Production of the hydrogen bomb is no analog here; the United States Water Resources Study is much more appropriate. This idealistic approach is rooted in a grave misconception of the research culture itself and in naive assumptions about the financial resources which the American people will (not ought to) put at the disposal of educational researchers. It is insidious in its tendency to set the most creative minds in education at bureaucratic pipedreaming.

6. Automatic impacts by research may vary with the type of investigation undertaken, but the evidence gives little support to this hypothesis. Least influential type apparently is the normative accounting of current status. But, the fair-haired favorite of those who would reform by typology control -- namely, evaluated live models of practice -- has been almost equally gentle in impact. In fact, the characteristics of research seem to have about as little to do with its effects upon practice as the characteristics of college professors have to do with the performance of their students as teachers.

7. Is all hopeless? Definitely not. If professional educators will get rid of two false stereotypes, research can reach, and improve I do believe, practice. First, the stereotype of research as a sort of deus ex machina passing miracles on a universe. There have to be sagacious, aggressive, and affluent go-betweens. This is no pipe dream; what the Ford Foundation, NCATE, and many other agencies have done to merchandise can be done again. Second, the stereotype of research at one end of a linear continuum and professional education practice at the other. The actual model should be that of solid state bodies moving in a plasma and the controlling rationale is analogous to that of modern plasma physics. The plasma is research, the solid state bodies are instructional endeavors and arrangements. This is the arrangement which best accounts for current impact, and which produces it. Interactions between plasma and bodies is two-way; both are necessary and the behavior of each induces responsive behavior by the other. Complete professional education is both not one, and not a diad. And, so far, there is little indication that high refinement of what is to be allowed as research related to teacher education is justified. Willing to try telesis upon the plasma as well as upon the suspended bodies, I emerge from my foray with conviction that the quantity, zealousness, and egregiousness of pursuit is the mass-medium most likely to energize the systems of professional education.

CHAPTER IV

PROJECTION OF RESEARCH IN TEACHER EDUCATION

Educational Theory Models: A Possible Way to Stretch the Bounds of Teacher Education Research

Elizabeth Steiner Maccia
The Ohio State University

1. The Paradox

In a research time, when even education is being researched, the education of teachers as teachers is slowly but surely being given up. Teachers are not to be educated in teaching, but are to be placed in teaching situations to find their own way. Teacher education is moving from the universities and colleges to the limbo of "art". The growth of programs, such as the Ford Foundation Program, and changes in credential requirements, such as in California, amply testify to the movement.

To emphasize the paradox, consider what it would mean to give up the education of engineers as engineers at a time when research has produced a body of knowledge for successful engineering practice. Engineers would be placed in engineering situations to find their own way, even though there is a basis for a successful way-finding that could be communicated. The absurdity of such programs for engineers would be beyond comprehension.

Some might question the existence of a paradox with respect to teacher education. The possibility of engineering education would be admitted, but teacher education would be declared an impossibility. The reasoning supporting this conclusion might be stated as follows. We can come to knowledge about the behavior of physical things, and thus have a communicable basis for control. The realm of the physical can be researched. There can be a basis for the education of engineers. We cannot, however, come to knowledge about human behavior in the institutional setting of the school, and thus cannot have a communicable basis for control. The realm of human school behavior cannot be researched. There cannot be a basis for the education of teachers as teachers. Teachers, consequently, must be made through baseless practice ("art").

The existence of educational research resulting in knowledge about human behavior in the institutional setting of the school cannot be denied. The paradox exists. We are turning our back on a communicable basis for control when we give up teacher education. The communicable basis for educative control certainly is neither as firm nor extensive nor as utilized as the communicable basis for engineering control. The knowledge resulting from educational research is more like many trickles than one rapidly flowing stream, and the many trickles are ignored. The paradox, therefore, is weak. Its weakness could account for the failure to recognize the contradiction between educational researching and the moving of teacher education to the limbo of "art".

2. The Paradox and Teacher Education Research

Teacher education research is restricted within narrow bounds. The way in which persons and groups of persons do behave about teacher education has provided one main focus for teacher education inquiry. Normative survey after normative survey has been conducted. To cite a few titles: "A Comparative Study of Student-Teaching Practices in Thirty-Eight Midwest Institutions"[1], "Teacher Opinion Poll on Teacher Preparation"[2], and Survey of Programmed Instruction in Teacher Education.[3] The characteristics of the student to be educated as a teacher and, to a lesser degree, the characteristics of the professor educating teachers as teachers have been another main focus for teacher education inquiry. Again normative survey after normative survey has been conducted, very often with use of a scale. Scale after scale, therefore, has been constructed. To cite a few titles: A Study of Characteristics of Perspective Teachers by Means of a Self-Rating Scale[4], "An Experimental Scale to Measure Motives for Teaching"[5], and "The Background, Experience, Present Status, and Self-Appraisal of the College Teacher of Education in Michigan"[6]. These bounds of the psychology and sociology of teacher education, provided the inquiry becomes more sophisticated, can give us knowledge of the individual and societal constraints governing the education of teachers. For example, we can come to know the opinions about teacher education of the students being educated as teachers. Such opinions will constrain or place within limits their education as teachers. We might even come to know the conditions related to given opinions, and so have knowledge to control the opinions. Knowledge of constraints, even if complete enough to permit us to control them, will not give us knowledge of teacher behavior as an integral part of human behavior in the institutional setting of the school. It is such knowledge that forms the communicable basis for educative control, and so forms a teacher education content. The bounds of psychology and sociology of teacher education are too narrow.

---

[1] Gail Inlow, Journal of Experimental Education, 1960, 28, 337-349.

[2] NEA Research Division, NEA Journal, 1963, 52, 34.

---

[3] American Association of Colleges for Teacher Education, A Report by Subcommittee on Instructional Media and Teacher Education of the Committee on Studies, 1963.

[4] Sister M. Fridian, Fort Wayne, Indiana: Saint Francis College, 1961.

[5] Gerhard Lang, Journal of Educational Research, 1958, 51, 687-693.

[6] Paul Henry Emerich, Unpublished doctoral dissertation, University of Michigan, 1957.

To explicate further why a knowledge of constraints alone cannot give us knowledge of the content, an analogy might be helpful. Mechanics may be divided into statics and dynamics. The former treats of stresses and strains, while the latter of energy exchanges. Stresses and strains tell us nothing of energy exchanges, only of the limitations to be placed upon them.

The analogy also points to a conceivable way of naming the aspect of teacher education which is considered beyond the bounds of teacher education research. Teacher education may be divided into statics and dynamics. The statics of teacher education comprise its constraints--the way persons and groups behave with respect to teacher education and the conditions related to such behaving, and the characteristics of teacher educators and students to be educated as teachers and the conditions related to such characteristics. The dynamics of teacher education comprise its content--teacher behavior as an integral part of human behavior within the institutional setting of the school. It is the dynamics of teacher education that is considered beyond the bounds of teacher education research. While some knowledge of the statics of teacher education is being developed through teacher education research, the development of knowledge of the dynamics of teacher education is ignored by those engaged in teacher education research.

The restriction of teacher education research within the narrow bounds of the psychology and sociology of teacher education dramatically underlines the failure of those in teacher education research to grasp the paradox. At a time when the dynamics of teacher education is emerging and has only to be claimed and furthered by stretching the bounds of teacher education research, the statics of teacher education is pursued vigorously. The result could well be a final teacher education research act--a survey of the demise of teacher education.

3. The Intent of this Paper

If knowledge of the dynamics of teacher education could be changed from many trickles to a rapidly flowing stream, then the communicable basis for educative control could begin firming and extending. Soon all would discern a discipline of education as emergent and emerging. The paradox could be ignored no longer. The educators of teachers would claim the discipline of education as their own and utilize it. Teacher education would be returned to the universities and colleges. Moreover, researchers in teacher education would claim the discipline of education as their own and extend it. The bounds of teacher education research would be stretched to include the dynamics of teacher education. The paradox would be resolved.

It is the intent of this paper to present a possible way of stretching the bounds of teacher education research. The possible way is educational theorizing through models. The educational theory models approach might result in the conditions necessary for stretching the bounds of teacher education research: acceleration of production and unification of the knowledge of the dynamics of teacher education, i.e. of the knowledge of teacher behavior as an integral part of other school behavior.

4. The Baconian Perspective and Its Limitations

The empiricist's rebellion against the speculative era which led to the discounting of all theory is past. Few educational researchers refuse to recognize that theory can be more than mere speculation and, what is more important, that it is practical. The technological advances brought about through progress in theoretical formulations having predictive power cannot be ignored by most, and so serve as their testimony for educational theorizing.

On the other hand, the perspective of Bacon still governs men. In fact, it dominates the way of researching, including the way of theorizing, in education. The way of researching inherent in the Baconian perspective is antithetical to the theory models approach. Consequently, this way and its limitations must be presented in order to break ground for the way of educational theorizing through models.

Bacon set forth his view of the true way of researching through contrast with another way.

> There are and can exist but two ways of investigating and discovering truth. The one hurries on rapidly from the senses and particulars to the most general axioms; and from them as

> principles and their supposed undisputable truth derives and discovers the intermediate axioms. This is the way now in use. The other constitutes its axioms from the senses and particulars, by ascending continually and gradually, till it finally arrives at the most general axioms, which is the true, but unattempted way.[7]
>
> Each of these two ways begins from the senses and particulars, and ends in the greatest generalities. But they are immeasurably different; for the one merely touches cursorily the limits of experiment, and particulars, whilst the other runs duly and regularly through them; the one from the very outset lays down some abstract and useless generalities, the other gradually rises to those principles which are really the most common in nature.[8]

From this setting forth, came the perspective in which a researcher is one who goes out to observe the world, and thereby arrives at knowledge. Knowledge results when one obtains a body of laws from the facts. After observing, generalizations are formed. The logic involved here is thought to be inductive. Because the generalizations are taken to be quite tentative, they are called 'hypotheses' and are subjected to check by means of further observations. When possible, the observations are made under controlled situations which permit precision and ease of observing. Experimentation is not always possible. In this way, supposedly a body of laws which constitute knowledge could be built up. In the context of research with respect to the dynamics of teacher education, one would go into the school and observe teacher behavior as an integral part of all human behavior within that setting. Such observations would permit the sorting out of the kinds of teacher behavior and their interrelations and relations to the kinds of student behavior, administrator behavior, and other behavior within the school. These generalizations (hypotheses), then, could be checked through further observations. In this way, supposedly a body of laws which constitute the dynamics of teacher education could be built up.

---

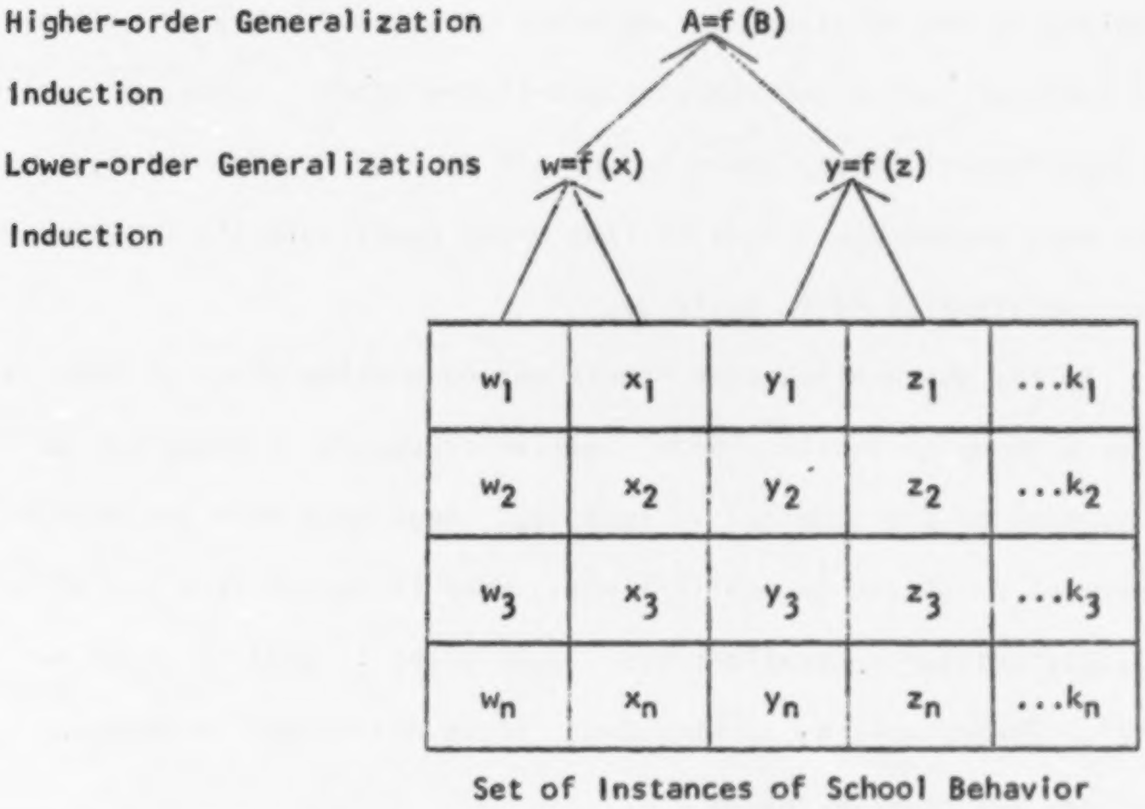
[7] Novum Organum, Summary of the Second Part, Aphorism 19.

[8] Ibid., Aphorism 22.

In the above discussion, there was no consideration of what is meant by a 'body of laws'. 'Body' implies structure or organization. The laws must be put together in some way. Knowledge does not consist of a heap of unrelated generalizations. What is wanted is a set of systematically related generalizations. Such a set is what is meant by 'theory'. Theory must be constructed. It is not enough to observe, generalize, and observe again.

According to an educational researcher who has a Baconian view, construction of theory also demands the use of inductive logic. Through induction, generalizations of the generalizations are formed. Such generalizations should be formed as often as necessary to rise to the most general generalizations. The entire set of generalizations would be systematically related, because they would form a deductive system. The lower-order generalizations would follow from the higher-order generalizations. In the context of research with respect to the dynamics of teacher education, one would attempt to generalize the generalizations derived from what is observed of teacher behavior in the school setting.

Schema I may serve to summarize the Baconian way of researching with respect to the dynamics of teacher education.


Higher-order Generalization
A=f (B)
Induction
Lower-order Generalizations
w=f (x)
y=f (z)
Induction
Set of Instances of School Behavior

w_1	x_1	y_1	z_1	$\ldots k_1$
w_2	x_2	y_2	z_2	$\ldots k_2$
w_3	x_3	y_3	z_3	$\ldots k_3$
w_n	x_n	y_n	z_n	$\ldots k_n$

Schema 1: The Baconian Way of Educational Researching

When one pays close attention to what the adequate researcher does do, it becomes apparent that the Baconian perspective has limitations. The adequate researcher comes to the world with clearly stated questions. He does so, because he knows that questions must be asked of the world. The world does not dictate itself to man. Since questions must be asked of the world, it is important to make clear the questions being asked. To make clear a question also involves presentation of its context. The researcher and others must know the questions he is asking. Knowledge is an intersubjective affair. Furthermore, awareness might lead away from wrong-headed questions. Wrong-headed questions are given wrong-headed answers. To state the matter differently, one brings theory to events.

If the researcher takes a Baconian perspective and denies this, then he operates on the basis of theory he claims not to have and which consequently is not elucidated and may be inadequate. No replication of the research is possible, and there is no possibility of modifying the theory toward adequacy.

Within research with respect to the dynamics of teacher behavior, the Baconian perspective leads researchers to ignore the theory they bring with them to their observations of behavior within the school. It is the theory that is giving them the set of categories or variables or the taxonomy. For example, the Jacksonian democratic ideology might operate to exclude motivational behavior of the teacher other than that of acceptance and rejection (reward and punishment). The Jacksonian democratic ideal centers about equal acceptance for all. Awareness of the fact that one is taking a group dynamics approach restricted in terms of the Jacksonian democratic ideology might lead one to seek a broader theoretical base, and so modify the theory toward adequacy.

Another limitation of the Baconian perspective becomes apparent when one notes that adequate theorizing is not simply summarizing lower-order generalizations. It is not the case in adequate theories that there is a relation of equivalence between the conjunction of the lower-order generalizations and the conjunction of the higher-order generalizations; rather the higher-order generalizations contain more than the lower-order generalizations. The system is open permitting the deduction of yet other lower-order generalizations. Adequate theory permits its own growth.

It has predictive power. Something other than expertise in shorthand is required. The theorist is not constructing a shorthand way of writing all the experimental laws. Induction is not the logic of theory construction.

The bounds of teacher education research, therefore, cannot be stretched by summarizing all the confirmed lower-order generalizations. The current knowledge of the dynamics of teacher education, the knowledge of teacher behavior as an integral part of other school behavior, would be unified, but the system would be closed. The production of further knowledge would be cut off. The discipline of education would be aborted.

5. The Theory Models Approach[9]

If neither deduction nor induction can be the source of theory, then what kind of logic is? In setting forth the way of researching, Peirce answered this question with retroduction[10] and redefined 'induction' as solely a statistical argument.

> The inquiry begins with pondering these phenomena in all their aspects, in the search of some point of view whence the wonder shall be resolved. At length a conjecture arises that furnishes a possible Explanation, by which I mean a syllogism exhibiting the surprising fact as necessarily consequent upon the circumstances of its occurrence together with the truth of the credible conjecture as premises. . . . The whole series of mental performances between the notice of the wonderful phenomenon and the

---

[9] This approach was developed in Cooperative Research Project 1632: The Construction of Educational Theory Models.

[10] Peirce used 'abduction' and 'retroduction' interchangeably.

> acceptance of the hypothesis . . . I reckon as composing the First Stage of Inquiry. Its characteristic formula of reasoning I term Retroduction . . . .[11,12]

> Induction may be defined as an argument which proceeds upon the assumption that all the members of a class or aggregate have all the characters which are common to all those members of this class concerning which it is known, whether they have these characters or not; or, in other words, which assumes that that is true of a whole collection which is true of a number of instances taken from it at random. This might be called a statistical argument.[13]

In the context of research with respect to the dynamics of teacher education, the Peircean way of researching would be as follows. One would devise taxonomies of teacher behavior, student behavior, and other behaviors in the school and devise interrelations of the categories (variables) of the taxonomies. Such devising would be through a point or points of view and not through observation, although the devising should be in a context of observations within the school. The devised theory of teacher behavior as an integral part of all human behavior within the school would be explicated through deduction, in order to obtain lower-order generalizations which are directly checkable. Finally, through induction the lower-order generalizations would be evaluated as to whether the instances of school behavior in terms of which they did check out were representative

---

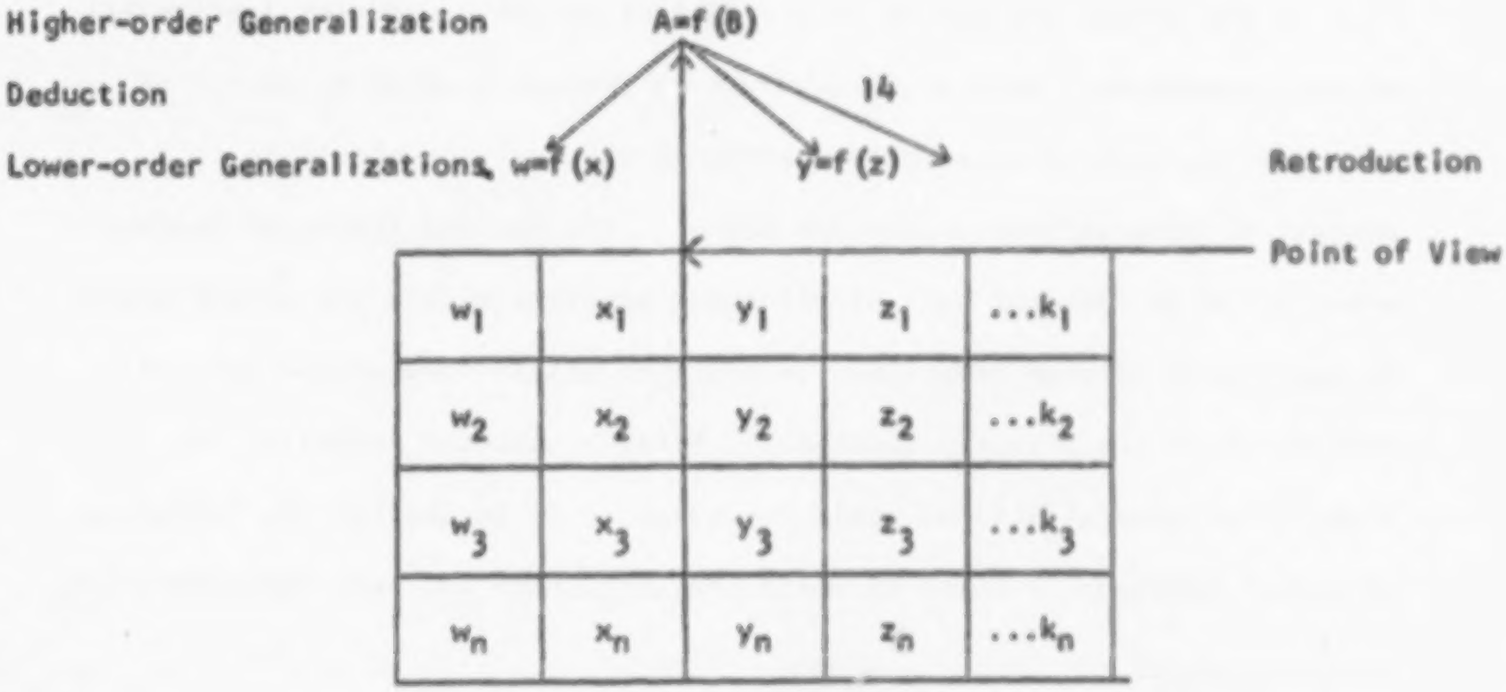
[11] Values in a Universe of Chance, ed. by Philip P. Wiener, New York: Doubleday Anchor Books, 1958, p. 367.

[12] Peirce used the term 'retroduction' to indicate that what is involved is a leading back. The theory or conjecture that emerges (conclusion) contains more than the point of view from which it emerges (premises). The implication, then, can hold only from the conclusion to the premises.

[13] Values in a Universe of Chance, pp. 45-46.

of the entire collection of such instances of school behavior. Such evaluation permits judgment of the lower-order generalizations as to whether they may be accepted or should be modified or should be rejected entirely. Actually rough evaluation takes place during the process of devising. Points of view are ruled out which will not produce adequate generalizations. It is precisely for this reason that devising should be done with awareness of the actual events taking place in the school.

Schema 2 is presented as a summary of the Peircean way of researching with respect to the dynamics of teacher education.


Higher-order Generalization
$A=f(B)$
Deduction
[14]
Lower-order Generalizations
$w=f(x)$
$y=f(z)$
Retroduction
Point of View

w_1	x_1	y_1	z_1	$\ldots k_1$
w_2	x_2	y_2	z_2	$\ldots k_2$
w_3	x_3	y_3	z_3	$\ldots k_3$
w_n	x_n	y_n	z_n	$\ldots k_n$

Set of Instances of School Behavior

Schema 2: The Peircean Way of Educational Research

---

[14] This arrow indicates the predictive power of the theory, which arises since it is not a mere summarization, i.e. $A=f(B) .\not\equiv. w=f(x)\cdot y=f(z)$.

This way of researching the dynamics of teacher education should lead to more adequate theorizing. One would be aware of the fact that he has a point of view or points of view out of which his theorizing about school behavior arises. He, hence, could move to modify these, if necessary. Moreover, the theory that emerges could have predictive power and not be closed off. The discipline of education need not be aborted. The conditions necessary for stretching the bounds of teacher education now could be present. Acceleration of production and unification of the knowledge of the dynamics of teacher education could occur.

To change the 'could' to 'would' more must be said of the Peircean way of researching, particularly with respect to the origin of points of view. The theory models approach must be introduced. Obviously, a point of view to devise educational theory originates from other theory, common sense and otherwise, known to the researcher. Theorizing, therefore, is limited in terms of the researcher's background. Such limitation could prevent adequate theorizing. The theory models approach makes deliberate the process of forming points of view. Such deliberateness permits the researcher to extend his background, if necessary. If he does not have in his background theory that could be reformed into a point of view from which to devise adequate theory, then he can set out to intellectually roam the disciplines. Such roaming could lead to discovery of an origin for a point of view,and the point of view could be formed. In forming the point of view, concepts from the theory are selected and arranged. The concepts may be modified in any way required for a point of view which will lead to adequate theory. The approach is essentially interdisciplinary, but it is not simply taking theory from one field into another. The term 'theory model' is used for the point of view formed from theory, and thus the approach is called 'the theory models approach'. This approach to educational theory is summarized in Schema 3.

Other Theory $\xrightarrow{\text{model formation}}$ Theory Model $\xrightarrow{\text{retroduction}}$ Educational Theory

Schema 3: The Theory Models Approach to Educational Theorizing

It is important to note that the use of 'model' differs from the common usage of educational researchers. Through content analysis of recent literature dealing with the use of models for the study of various aspects of education, it was found that theory models have been given little significance in that endeavor.[15] Instead, for most educational researchers, the expression 'theory model' would contain a redundancy, since the educational theory itself is taken to be a model insofar as it represents (is a model of) some aspect of education. This identification of theory and model led to a disregard of the approach to theory construction in which one theory becomes a model for another theory. Consequently, in educational theorizing, models usually were not considered a source of theory, and hence could not function in theory construction. Perhaps this is another way of indicating the prevalent Baconian perspective which cannot include recognition of the way of stretching the bounds of teacher education research which is being proposed.

---

[15] See pages 46 through 100 of the final report of Cooperative Research Project 1632.

6. Illustration of the Theory Models Approach[16]

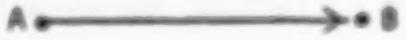
The intent of this paper has been carried out. The theory models approach has been presented as a possible way to stretch the bounds of teacher education research to include the dynamics of teacher education. Nevertheless, to further indicate the possibility of this way the outlines of a theory of teacher behavior and the theory model from which it was devised will be sketched.

Graph theory is a mathematical theory characterizing patterns which can be constructed from points and lines. Some graphs are digraphs insofar as they contain directed lines. The digraph leads to a structure concept; the components of the graph, point and directed line, generate a member concept and a directed relational concept. The theory of teacher behavior, therefore, will center about structure variables which are descriptions of the internal behavior of the classroom group and which consist of statements of relations among classroom group members.

The interpersonal relations within a classroom group will be delimited in terms of two clearly identifiable positions: teacher and student. The roles or behavior of the persons occupying these positions will be inducer whose behavior brings about a behavioral change in another person or persons and inducee whose behavior is changed by the inducer's behavior. Unless there is a directed relation between at least two persons, one person is directed to another person to bring about a behavioral change in that person; there can be no teacher (inducer) and student (inducee). This directed relation may be depicted through Digraph 1.

---

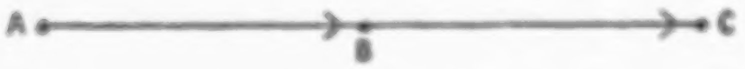
[16] See the final report of Cooperative Research Project 1632 for other illustrations.



Digraph 1

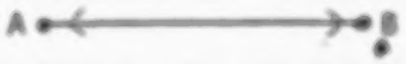
This directed relation points to a concept of influence, A influences B, and thus will be called 'an influence relation'.

Influence relations could be direct or indirect. Digraph 1 shows a direct influence relation, while Digraph 2 shows a direct influence relation of A over B and of B over C, and an indirect one of A over C.



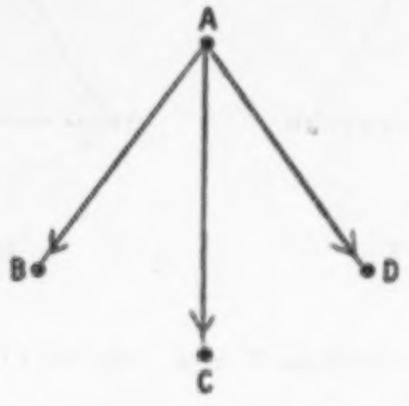
Digraph 2

Furthermore, there could be mutual influence, where each person is both teacher and student, as in Digraph 3.



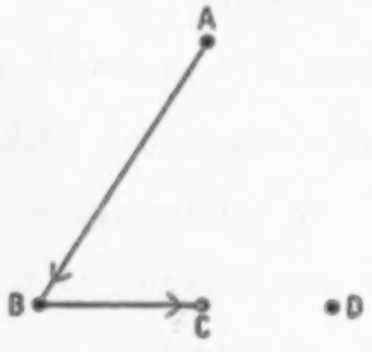
Digraph 3

The ordering of digraphs into subsets on the basis of their connectedness suggests many possibilities as to the influence structure of a given classroom. It is not the case that a classroom group necessarily has the influence structure of Digraph 4, because A is hired as the teacher and B, C, and D are enrolled as students.

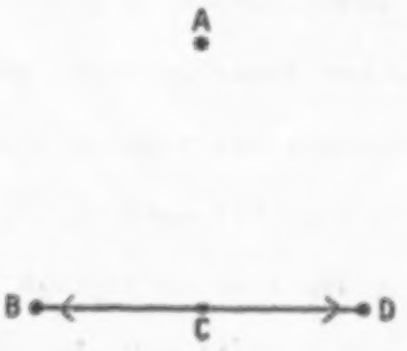


Digraph 4

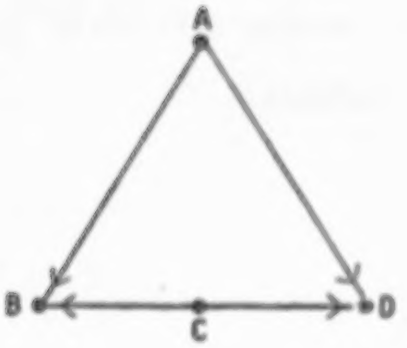
The classroom group might be structured according to Digraphs 5, 6, 7, or 8.



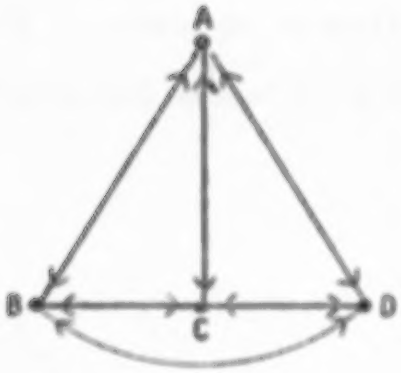
Digraph 5



Digraph 6



Digraph 7



Digraph 8

In Digraph 5, A directly teaches B and indirectly C through B directly teaching C. D is isolated, and taught by no one. In Digraph 6, the hired teacher, A, teaches no one. Student C teaches B and D; and C is actually not a student, since he is taught by no one. In Digraph 7, there are two teachers, A and C, who both directly teach B and D, the two students. In Digraph 8, every person is both teacher and student.

One can theorize about what structures will do what[17], and recorded observations suggest adequacy of this theorizing, although more theorizing and experimentation is required. To illustrate, an influence structure as depicted in Digraph 8, will produce behavior at the average of the group's initial behavior.[18] Such is the outcome of everyone taking both the teacher and student roles in the classroom.

---

[17] See graph theory model and educational theory on pages 101 through 138 in the final report of Cooperative Research Project 1632.

[18] John R. P. French, Jr., "A Formal Theory of Social Power," in The Psychological Review, 1956, 63, 181-194.

One cannot assume that because the teacher is the teacher, he is hired, he automatically has influence. As indicated in the use of Flander's interaction analysis, teacher talk that centers about direction and criticism (Categories 6 and 7) might indicate lack of teacher influence.[19] There might be no basis for teacher influence, because there is an inappropriateness between what is wanted of the student and what he can do and has done. For example, a student that does not understand algebra cannot be influenced to do calculus. In order to have an influence relation, therefore, the content of influence must be appropriate to the one being influenced. Even though appropriateness of content is present, there still might be no basis for teacher influence. A motivational basis, as well as a content basis, must be present.

What, then, are the possible motivational bases of influence? That the teacher is the teacher is one possible motivational basis. It is not the only one. The student also might let the teacher have influence over him because he might be punished, he might be rewarded, the teacher really can teach, or he likes the teacher. These possibilities provide the following kinds of influence with respect to their motivational bases: legitimate, punitive, reward, expert, and affective. Both punitive and reward influences are based upon expectation of behavior by another which is not valued or is valued respectively. A frown, a slap, and a F usually are not valued. A smile, a pat, and an A usually are valued.

---

[19] Edmund J. Amedon and Ned A. Flanders, The Role of the Teacher in the Classroom, Minneapolis, Minnesota: Paul S. Amedon & Associates, Inc., 1963, pp. 32-33.

Legitimate influence is based upon position, while expert influence is based upon idealized role. Persons are hired as teachers, at least in most contemporary societies. There are positions which they fill. Since they fill positions, they are legitimate. The teachers are the teachers. The strength of the influence based upon position will vary with the degree of recognition of the significance of the position by the group. If a community views its teachers as persons who can't, there is little basis for legitimate influence. Expert influence, on the other hand, is independent of the valuing of the group. When influence based upon expertise is present, a person is a student to another person whether that person is hired to occupy the position of teacher or not, because he judges that person to behave as one ought to to be a teacher. The last motivational basis for influence to be mentioned is a positive feeling state toward an individual. When one feels affection for another, then that individual can influence him.

Unless there are ways, or possible ways, for observing the bases for influence, there would be no sense in further theorizing with respect to other variables which could be manipulated to bring about various kinds of classroom structures. Are there such ways, or possible ways, for observing both content basis and motivational bases?

The limitation of achievement and aptitude measures, even if they were adequate in determination of student's past learnings and possible learnings, and of measures of classroom behavior, even if they were adequate in determination of teacher behaviors and student behaviors, becomes apparent through the graph theory model. Instruction is taken as an

4

influence relation. Instruction, therefore, becomes a relational term, and thus requires two things for its exemplification. Both teaching and learning are required for the exemplification of instruction. One cannot state that $I=f(B_T)$ and $I=f(B_S)$, where 'I' denotes instruction, 'B_T' teacher behavior, and 'B_S' student behavior. Only teacher behavior and student behavior together produce instruction. That is to say, one can state correctly only that $I=f(B_T,B_S)$.

Examples should indicate the limitation of current measures and analyses of classroom behavior. Encouragement of a student's behavior by a teacher might be interpreted as a motivational basis of the reward type. Provided there is also a content basis, instruction would be thought to take place. The teacher would be thought to be a teacher, and the student a student. What of the student's behavior? Is there any reward in common between what the teacher presents as a reward and what the student receives as a reward? If not, there is no motivational basis (unless the content functions as motivation). No instruction occurs. The teacher would not be a teacher, and the student not a student. Structuring by a teacher might be interpreted as a content basis. Provided there is also a motivational basis (unless the content functions as motivation), instruction would be thought to take place. The teacher would be thought to be a teacher, and the student a student. What of the student's behavior? Is there any structuring in common between what the teacher presents as structuring and the student receives as structuring? If not, there is no content basis. No instruction occurs. The teacher is not a teacher, and the student not a student.

At this point, the theory of teacher behavior as an integral part of human behavior in the institutional setting of the school could be developed further through an information theory model. Such development would indicate lines along which measures of commonality could be devised. Since this development has been set forth elsewhere[20], and the theory models approach has been illustrated through the graph theory model, it will not be repeated here. The sketched outlines of teacher behavior as part of a theory of the classroom as an influence structure may have indicated the power of the theory models approach. If so, a possible way of stretching the bounds of teacher education research to include the dynamics of teacher education has been demonstrated.

---

[20] In the final report of Cooperative Research Project 1632, see "An Educational Theory Model: Information Theory."

INTERACTION MODELS OF CRITICAL TEACHING BEHAVIORS

Ned A. Flanders
The University of Michigan

This paper will consist of an exposition of my convictions about teacher education based on my own research which has attempted to assess the social skills used by teachers in the classroom. Inferences about social skills are made from an analysis of the spontaneous verbal statements which occur in classroom discourse.

The Problem Restated

We are here to discuss teacher education and research on teacher education. To do this we must consider what is said in terms of the purposes of teacher education. For those reacting to this paper, here are my presumed purposes of teacher education.

The purpose of teacher education is to start with an average college student and produce a beginning teacher who can--at some minimal level--

(a) Accept the need to control his own behavior for professional purposes,

(b) identify the range of teaching behaviors that are required in teaching,

(c) perform these behaviors at appropriate moments in spontaneous situations,

(d) predict the consequences of providing various teaching behaviors under specified conditions,

(e) plan a strategy of teaching behaviors for specified purposes and situations,

(f) collect information about his own behavior and the consequences of his behavior in classroom settings,

(g) achieve those resources necessary to continue his professional growth on the job,

(h) identify his own preferred outcomes of classroom instruction as functions of his own behavior.

The purposes listed above refer to the professional training of a teacher. The fact that a teacher MUST know the content he is to teach is so self-evident that it hardly seems worth mentioning.

Critical Teaching Behaviors

The use of interaction analysis:--The critical teaching behaviors to be described in this chapter will make use of interaction analysis categories that have been used in my own research. There are, of course, other category systems. For those readers who are unfamiliar with this technique, it may be useful to read chapter six in the Handbook of Research on Teaching by Gage, or to refer to the appendix of this particular paper which has a short eight page reference to my own set of categories. Following the University of Minnesota adage, "If you can't measure it it's not worth talking about," the critical teaching behaviors to be discussed in this section will make use of the matrix technique of tabulating interaction analysis data. An understanding of this technique is essential to reading the material which follows.

Most of what has been written in the preceding pages of this paper placed considerable emphasis on overt behavior. This emphasis has many ramifications. It means that what we teach in teacher education must be understood by incorporating it into the personal overt behavior of the teacher candidate. It also means that any inconsistency between the teaching methods used by the professor of education and the principles of teaching which he expouses may well produce such an important conflict (between ends and means) for the students that they cannot transform their cognitive understanding into their personal behavior.

The paragraphs to follow, in this section of the paper, will describe critical teaching behaviors. I believe these critical behaviors can be and should be taught in teacher education. Each critical behavior pattern will be illustrated in a matrix, hopefully making clear what overt behaviors are present in each instance.

It is self-evident that if teachers in preparation learn to classify overt behavior by some method like interaction analysis, in turn, they will be in a position to refer the goals of their own training to behavior patterns and to assess their own progress toward these goals.

For my own purposes, I have defined a critical teaching behavior as a pattern of acts that -- a) are logically related to certain educational outcomes, b) follow a certain sequence with measurable probability, and c) seem crucial in terms of a theory of teacher influence verified by past research.

The first three behavior patterns to be discussed below are quite typical of common practice in classrooms according to our research data. There more common practices are presented as models of content exposition by the teacher, teacher directed drill, and giving directions which the students are to carry out. The fourth model is concerned with stimulating more independent thought by students. The fifth model is concerned with the affective aspects of student reactions. These last two models occur less frequently in the average classroom and formations conducive to such interaction are less likely to be seen.

Models found in common practice:--When you step inside a classroom the chances are that the teacher will be expressing his own opinions in the form of lecture. In Figure One, this would place us in the 5-5 cell, indicated by the arrow which says "start here." As the teacher is lecturing he may think of a question and as he formulates it he moves to the 5-4 cell. If the question is longer than three seconds he moves up to the 4-4 cell and continues to formulate the question. At the end of a question a student responds and the chances are that he will respond

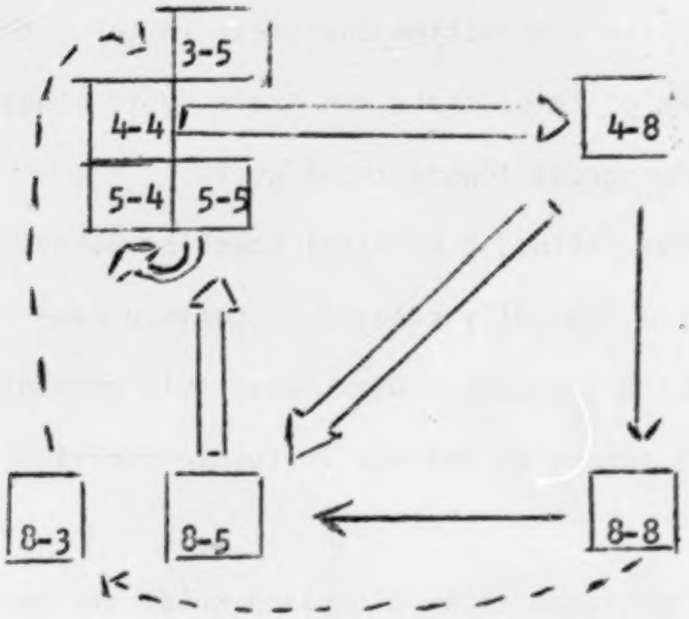


Figure One

High Content Emphasis Under Close Teacher Direction

using terms imbodied in the teacher's question. Such answers appear in the 4-8 cell. The majority of questions asked by a teacher, who has been lecturing, are sufficiently narrow that they can be answered by a student in less than three seconds. Thus, the immediate response of the student occurs as a single tally in the 4-8 cell to which a teacher is most likely to respond by expressing more ideas of his own, and this occurs as a tally in the 8-5 cell. Additional expression of opinion by the teacher occurs as additional fives and is tabulated in the 5-5 cell. In Figure One, the heavy arrows going from the 4-4 cell to the 4-8 cell, from the 4-8 cell to the 8-5 cell and from the 8-5 cell to the 5-5 cell represent the most frequent pattern in a random sample of classrooms representing common practice.

Figure One also illustrates less probable alternative sequences that are possible in this particular communication circle. To the right there is a thin arrow going from the 4-8 cell to the 8-8 cell and then back to the 8-5 cell. This particular pattern would occur if the answer of the student took longer than three seconds, producing a series of 8's, tabulated in the lower right hand 8-8 cell.

The dotted lines in Figure One illustrate a second alternative pattern, which is the next most frequent embellishment. When a student takes more than three seconds to answer, and thus produces an 8-8 sequence pair, the teacher sometimes acknowledges the idea expressed by the student very briefly, taking less than three seconds. Thus, a "three" occurs in the sequence pair 8-3. This brief acknowledgement is immediately followed by additional lecturing which produces a tally in the 3-5 cell and the teacher then moves from the 3-5 cell to the 5-5 cell.

Figure One, then, represents a frequently occurring pattern of interaction between the teacher who is in charge of positing content and who occassionally asks questions to which the students can reply briefly. In the side patterns it is possible for the teacher to acknowledge briefly the contribution of the student, but this is a small part of the total interaction. The central core of the verbal communication is the teacher's expression of content.

Figure Two represents a basic quick drill model in which short questions are asked by the teacher and short responses are given by the pupils. This direct 8-4 to 4-8 communication is shown by the heavy arrows. There are two side tracks to this basic pattern. In the event that a student requires longer than three seconds to answer a question, an 8-8 sequence pair occurs which is shown in the lower right hand side of the diagram. In the event that the teacher takes longer than three seconds to ask a question a 4-4 sequence pair occurs, shown on the upper left hand side of the diagram.

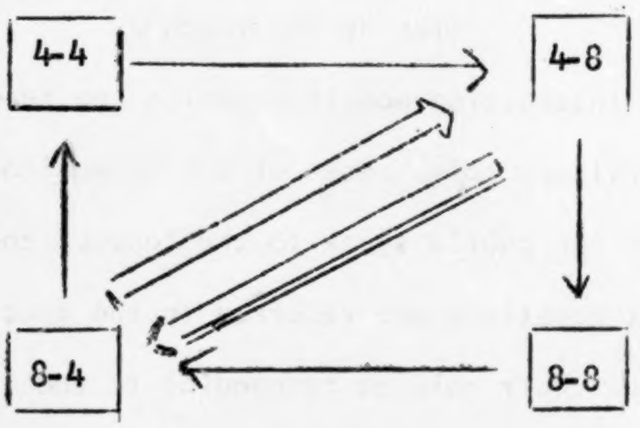


Figure Two

Teacher Directed Quick Drill

Figure Three shows a slight embellishment on the basic drill model. In this instance the basic drill relationship between 4-8 and 8-4 is interrupted occassionally by teacher explanation. Most often this break occurs as an 8-5 sequence pair in which a teacher lectures in response to a student statement. The dotted lines show silence following a teacher question, 4-10, and the teacher repeating the question or returning to further lecture, see the 10-4 and 10-5 cells leading to the 5-5 cell. Then the cycle returns to question and answer sequences. Figure Three illustrates a possible variation that typically occurs when Model One is combined with Model Two and might occur when drill is interrupted for explanation by the teacher.

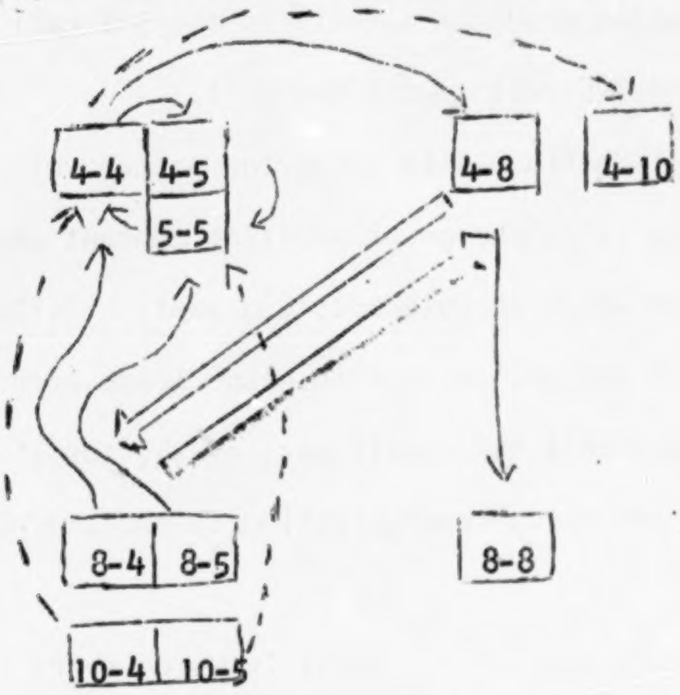


Figure Three

Dr.ll Combined With Lecture Demonstration

The first three figures are interaction models in which the teacher takes a very active and direct supervisory role. Most of the communication is controlled by the teacher because the pupils speak to the teacher and less frequently to each other. Most questions are referred to the teacher for his judgment and the students see their role as responding to the teacher and to his ideas.

Figure Four shows a typical direction giving model. The sustained giving of directions by the teacher occurs as sequence pairs in the 6-6

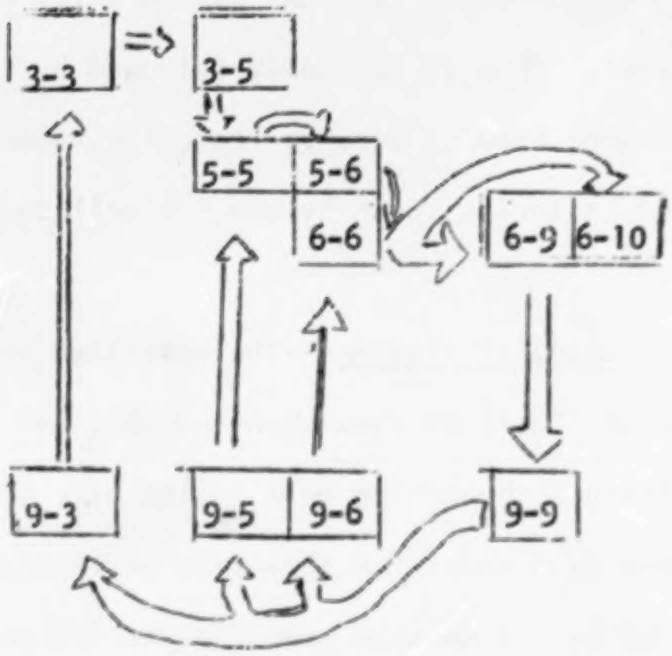


Figure Four

Teacher Gives Directions With Some Clarification

cell. Most often two events are likely to follow; first, direction giving can be followed by silence shown by the 6-10 cell; and second, direction giving can be followed by student initiation shown by the 6-9 cell. Most often, in these latter instances, the student initiated comment is a request for clarification and occasionally an expression of resistance to the directions given by the teacher.

A sub-pattern, not illustrated in Figure Four, appears as high frequencies in the 6-7 and 7-6 transition cells, whereby a teacher turns from giving directions to criticism and then returns back to giving directions. This in combination with a high loading on the 6-9 cell, is a pretty clear indication of student resistance to the directions the teacher has given. A teacher normally expects compliance to the giving of directions and in many instances of cooperation the giving of directions is followed by silence or category eight.

Occasionally the comments of a student are developed into longer statements which is shown by the arrow from the 6-9 cell down to the 9-9 cell. When sustained student initiation talk indicates difficulty in following directions, the teacher often explains and/or repeats directions making use of the 9-5 or the 9-6 cells. Occasionally the teacher responds to the ideas expressed by the student which is shown by the arrow leading from the 9-9 cell to the 9-3 cell. This is typically followed by further clarification of the student's idea leading back to lecturing, shown by the 3-5 cell and then sustained lecturing shown by the 5-5 cell and on to giving directions 5-6 to 6-6.

Models involving more student initiation:--The sustained self-directed inquiry by students with classroom communication that reflects their own ideas requires a different supporting role on the part of the teacher. Figure five will serve as a model for this type of interaction. In the model the questions asked by the teacher occur in the 4-4 cell because they are longer and often involve more general or abstract concepts. The arrow A_1 going to the 4-9 cell means that the question was sufficiently broad to permit the student to express his own ideas (not the teacher's) in reacting to the question. The A_2 arrow goes down to sustained student participation which frequently follows because broad questions usually take longer than three seconds to answer.

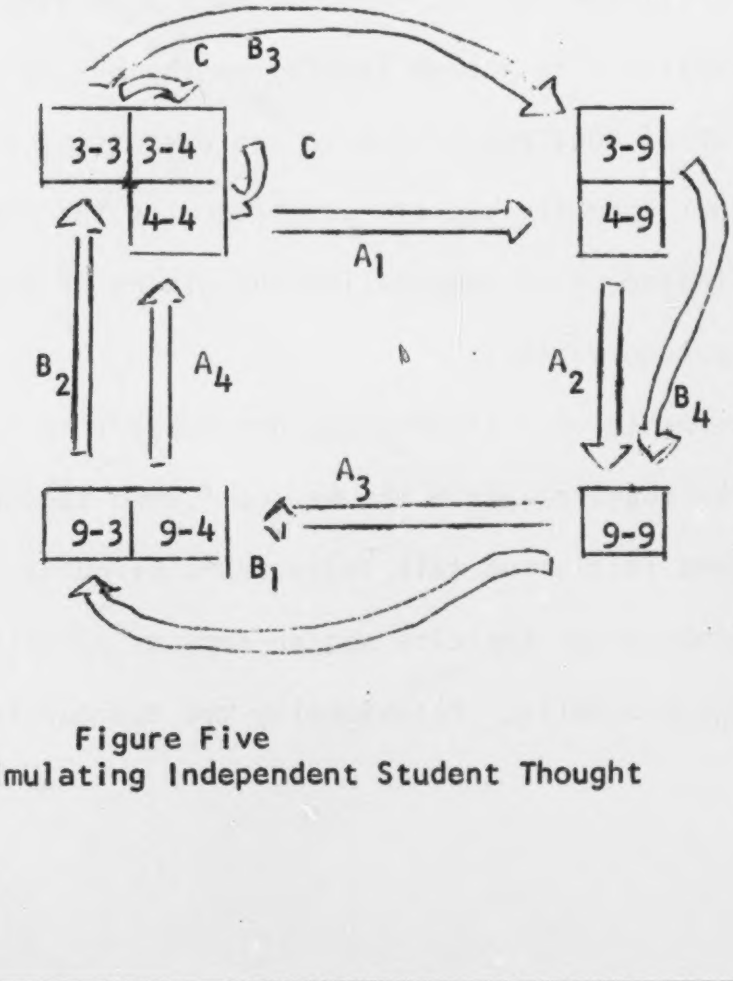


Figure Five
Stimulating Independent Student Thought

Arrow A_3 is one route in which the teacher decides to respond to student participation by introducing new ideas in the form of questions, see the 9-4 cell. This route continues on A_4 to the 4-4 cell. This basic inner cycle is most often concerned with subject matter content which seems to require guidance and direction from the teacher.

The use of category 4 instead of 3 indicates that these questions are new ideas introduced by the teacher. Should the teacher ask a question based on the ideas expressed by the student this would be categorized in category 3.

Part of the time the teacher's reaction to student participation is to clarify or somehow utilize the ideas expressed by the student. This cycle is illustrated in Figure Five by the outer "B" arrows. It starts with the B_1 arrow leaving the 9-9 cell, going to the 9-3 cell and then on up, along Arrow B_2, to the 3-3 cell. In this model the teacher is likely to elaborate for longer than three seconds in utilizing a student idea and thus, we would expect higher frequencies in the 3-3 cell. If the teacher formulates a question based on student ideas, this is indicated by the B_3 arrow leading to 3-9. The continuing expression of student ideas is illustrated by the B_4 arrow leading down to the 9-9 cell. This model, illustrated by the "B" arrows give greater emphasis to the ideas expressed by students than the inner "A" route.

On some occasions, the teacher may shift to his own ideas in the formulation of a question or (in lecture not shown) which follows the sequence 3-3, 3-4, 4-4 and is indicated by the "C" arrows between these cells.

For the teacher a critical choice is made between the 9-3 and the 9-4 cells shown in the lower left hand side on the diagram. This is a choice in which the teacher must decide whether to clarify the ideas expressed by the student (9-3 cell) or to introduce new ideas of his own by asking further questions (9-4 cell). Similarly another choice point for the teacher occurs when the "C" route is used.

Apparently most of the teachers we have observed do not see much application of this model to most of the classroom learning objectives.

On very rare occasions in the classroom a teacher turns his full attention to the feelings and attitudes expressed by boys and girls in their verbal participation or infers this from some aspect of their behavior. Figure Six shows a typical model of the teacher responding to the effective aspects of student verbalization or behavior in a constructive manner.

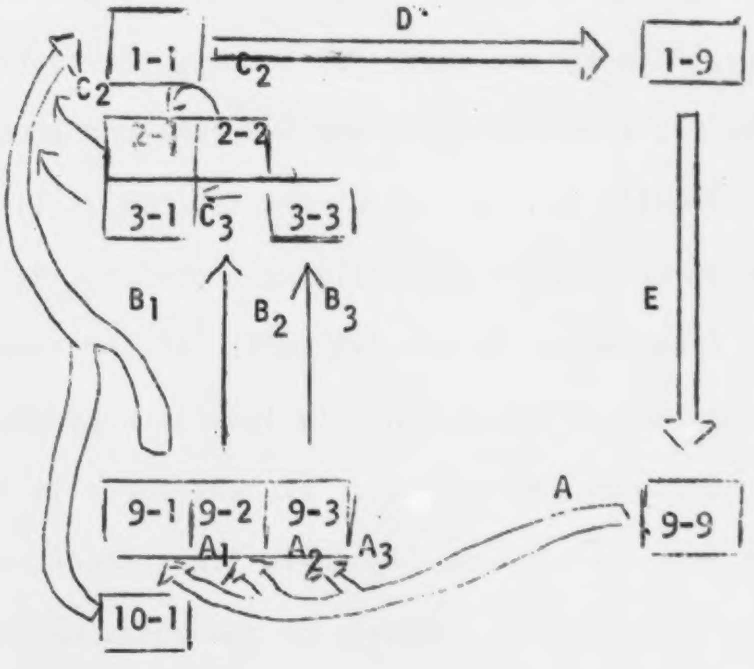


Figure Six

Attending to Student Feelings

This particular cycle begins with the main flow of arrow A from the 9-9 cell to a reaction on the part of the teacher in terms of the pupil's feeling - A_1, giving praise or encouragement - A_2, or the pupil's ideas - A_3. The teacher also might make an inference about the affective aspects of classroom interaction and pick it up as an interpretation during silence shown in that part of the B_1 arrow coming from cell 10-1. The main flow of teacher reaction to feeling would be carried through arrow B_1 into the 1-1 cell where it would be further developed by the teacher. Direct pupil reaction is illustrated by the D arrow leading to the 1-9 cell and then by arrow E to the 9-9 cell.

Critical decisions are required when the teacher makes the transition from the intellectual aspects of what a pupil says to the affective aspects. This is shown in Figure Six by the B_3 and C_3 arrows. Another route to the interpretation of feeling involves praise and most often occurs when the teacher is attempting to re-enforce positive affective reactions to help motivate students. This latter route is shown by the B_2 and C_2 arrows. Very few teachers find the opportunity or possess the skill to make these transitions. For example, the sum of all tallies falling into the entire Category One column averages less than one-half of one percent of teacher talk.

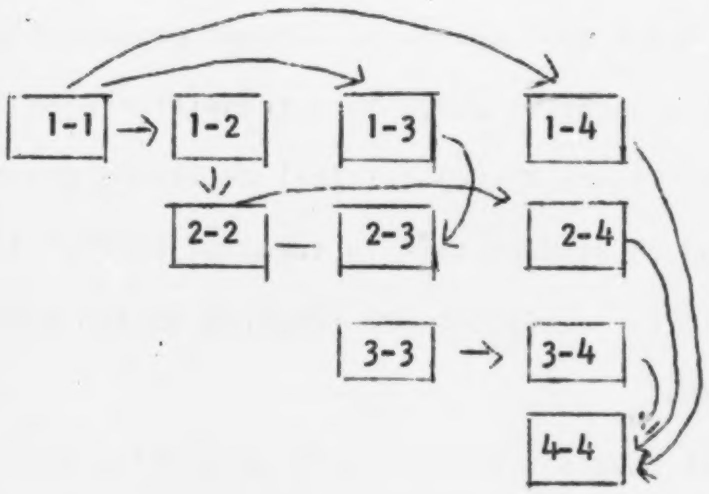


Figure Seven

Teacher Transitions from an Affective to an Intellectual Emphasis

A reverse set of critical transition behaviors occurs when the teacher moves from the affective realm to the intellectual realm of classroom communication. The various routes that are possible are shown in Figure Seven. Teachers only rarely make these transitions because events in Category One are so rare.

One of our studies involved both two hour combined English-social studies "core" classes at the seventh grade level. We were expecting greater use of Category One in the two hour classes based on the argument that a teacher who believed in the "core" philosophy would pay more attention to the affective aspects of student behavior than would teachers of eighth grade mathematics. The reverse turned out to be true by a five to one ratio. As a hindsight explanation, perhaps students develop more affective reactions trying to learn mathematics and thus confronted, the teacher reacts to student feelings more often. Our data would suggest that the social skills involved in the patterns shown in Figures Six and Seven are needed in all classes and that the more rigorous nature of mathematics is no reason to ignore this aspect of teacher training. Indeed, the reverse reasoning seems more appropriate.

A summary of the models of critical teaching behaviors:--In each of the models, so far discussed, decisions are required of the teacher at critical transitions.[1] In Model One, sustained content presentation, the teacher decides when to ask a question which is a transition from Category Five to Four. In Model Two (Figure Three) critical decisions are necessary to decide whether to respond to student talk in terms of further lecture or by asking questions. Similar decisions are required in the model concerned with giving directions.

The fourth and fifth models concerned with developing and maintaining more independent student thought processes and with handling the affective reactions of students, involve even more critical choices for the teacher.

One can summarize these critical decisions by designating certain areas within the matrix. Probably the most important decision area occurs in rows eight and nine, columns one through seven. All tallies in these

---

[1] Transitions are sequence pairs with different numbers; steady-states are sequence pairs with the same number. More than one-half of all sequence pairs, on the average, are steady-state.

14 cells represent the first verbal reaction of the teacher at the moment a student stops talking. When the student stops should the teacher express his own ideas, give directions, or ask further questions to shift the orientation of the student? On the other hand, is more to be gained by expanding the idea expressed by the student, praising his contribution, or interpreting the affective aspects of his participation? Once this decision is made, during the spontaneous give and take of a verbal exchange, the effect is to move from one to another of these models.

The second area of critical decisions occurs within the sustained talk of the teacher. Once the teacher commits himself to an initial reaction at the cessation of student talk, transitions are still possible. While lecturing a teacher can shift to questions, or refer back to ideas expressed by students, or praise earlier contributions. These transitions occur in rows and columns one through seven and determine, in the final analysis, the opportunity for student reactions when the teacher stops talking. The last thing said by a teacher, just before the student starts to talk, is clearly indicated by the cell frequencies in columns eight and nine, rows one through seven. The proportional frequencies in these cells will reflect the decisions made by the teacher, just before student talk.

One might ask whether anything new or unusual is being said in this summary concerning critical decisions. Surely, to say that -- how a teacher first reacts to student contributions and how he creates opportunities for student participation are crucial in classroom communication-- is to say nothing new, at least for the thoughtful observer of the teaching process. Yet, something new is being said here, providing one sets these comments in the context of current, average teacher performance. On the average, teachers do not make these decisions easily, they do not move from one model to another in response to the different purposes of classroom communication.

Given the premise that what has been said is not news and yet average teachers do not exhibit flexible adaptation of their own behavior in guiding class discussion, only one conclusion remains possible. Apparently teachers are aware of the crucial decisions and important models of teacher influence, but they are not able to implement this knowledge. They know, but they can't act out; they have the right intentions, but their actions do not match their intentions.

To accept what has been said in the previous paragraph is tantamount to saying that teacher education must include behavior practice so that what is understood at an intellectual level can be translated into the spontaneous action level, that is, incorporated in one's own behavior. Perhaps the major weakness of teacher education, as we know it today, is that professors of education do not see themselves as the midwives of this kind of personal, self-relization. Professors of education consider that their responsibilities are accomplished when the teacher candidate has been exposed to the concepts and principles of teaching and can show his awareness on a test. It matters little that the more enterprising professor of education devises a unique and unusual test which requires that the prospective teacher think through what he "ought" to do, that is, demonstrate that he can "act out" what to do next "in his mind". This indicates both awareness AND understanding. Nevertheless, the crucial test is whether he can act out in spontaneous interaction and demonstrate, by his own behavior, that he not only understands, but that he can transform this understanding by controlling his spontaneous behavior.

These more difficult objectives of teacher education will require a special contribution from those of us whose research involves the quantification of the qualitative aspects of spontaneous behavior. Our systems of interaction analysis may become techniques of instruction in teacher preparation programs. The education instructor will be more interested in research procedures that have practical applications to teacher training, that can be adapted to education courses at the college level. Systems that are complex and costly to employ, that make use of recorded behavior which can be replayed again and again for intensive analysis, may contribute to our knowledge about the teaching process, but they will be too clumsy for use in teacher education.

Other Category Systems That Can be Adapted to Matrix Analysis

Any set of categories used in interaction analysis can be tabulated into a matrix of rows and columns to indicate sequence pairs. Given "N" categories, a tabulation of observed events into a matrix of N rows and N columns will provide N^2 categories of paired events at no increase in work beyond keeping the original sequence of events ordered. Before turning to a discussion of the implications of what has been said for teacher education and research on teacher education, I would like to consider, however briefly, a set of categories different than the ten I have been using for over ten years.

Each category system is designed to give emphasis to a particular conceptual framework. Suppose it was of interest to adapt the matrix form of tabulation to a set of categories concerned with the cognitive aspects of logical reasoning as it occurs in classroom discourse. Suppose further, that one's model of cognitive reasoning borrowed some of its concepts

Table One

Cognitive Categories for Matrix Interpretation

Behavior Description	Category Numbers			
	Asking For		Giving	
	Teacher	Student	Teacher	Student
facts and opinions	1	11	6	16
explanation-interpretation	2	12	7	17
group common elements, label	3	13	8	18
generalizations and predictions	4	14	9	19
statements, not above	5	15	10	20

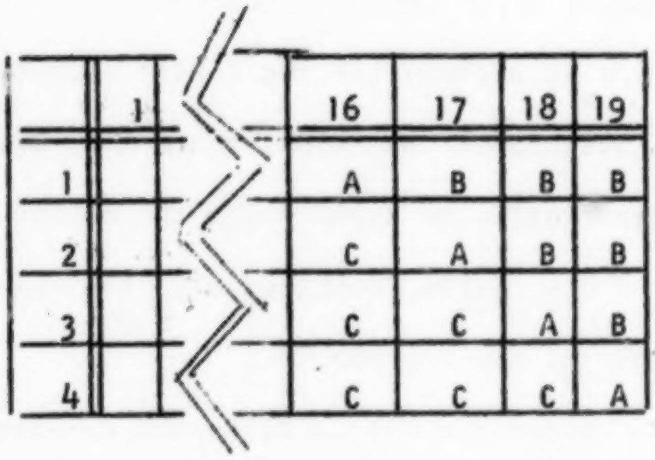
No verbal statement is category 21

the creative, exciting, and inciteful research of Dr. Hilda Taba[1]. One sequence she discusses involves thought development which might occur in a 15 to 30 minute class discussion. First, the elements of a problem are differentiated. Second, the elements are grouped into homogeneous clusters and each cluster is given a label. The label is, by definition, at a higher level of abstraction than the elements making up each set. Third, relationships between clusters can be hypothesized using the short hand labels. Fourth, generalizations from these relationships are discussed and predictions are made in an effort to apply these relationships in different situations.

---

[1] I believe that Dr. Taba's current research on the reasoning processes of elementary school children in class discussions has the potential of making an unusually fine contribution to understanding the teacher's role in logical discourse. See "Teaching strategy and learning", _Calif. J. for Instructional Improvement_, Dec. 1963.

Suppose these ideas from Dr. Taba's research were used as the basis of interaction analysis categories with the intent of tabulating them into a matrix. Table One provides for 21 categories some of which would probably be used so infrequently that they could be combined and others eliminated so that the most efficient[2] system could be gradually developed.



	1	16	17	18	19
1		A	B	B	B
2		C	A	B	B
3		C	C	A	B
4		C	C	C	A

Figure Eight

Interpreting a Section of a Cognitive Matrix

Figure Eight shows one section of the 21 x 21 matrix that will be used to illustrate some of the inferences that are possible from an analysis of the cognitive aspects of classroom discourse. All cells with the letter "A" show a one-to-one correspondence between the level of abstraction of the teacher's inquiry and the initial response made by the student. Cells marked "B" represent responses at a higher level of abstraction than is asked for by the teacher. Cells marked "C" indicate responses which are below the level of abstraction intended by the teacher's inquiry. The proportion of tallies classified into the type A, B and C cells would provide information about the effectiveness of the teacher's ability to "lift" the level of abstraction. With the B responses greater than C, the students are moving faster than the teacher; the reverse would occur when the teacher was moving too fast. By tabulating matrices separately for the first, second and third ten minute periods of class discussion, one might trace this development over time. It may be more informative to avoid rigid ten minute periods and designate the time limits of one matrix, compared with the next, according to the presumed intentions of the teacher.

---

[2] I believe that the most efficient systems contain the fewest number of categories necessary to make the distinctions of interest to the researcher. The difficulties do not arise from the procedures of observation, but in the researcher's statement of the problem. Fewer categories are needed when the research problem is stated with more precision.

This brief excursion into a different category system illustrates the application of matrix analysis to an area of interest other than social skills.

Incidentally, it is obvious, in these days of computers, that sequences of more than two events could be tabulated in multidimensional matrices. Even though we humans have trouble visualizing a four demensional matrix, a computer can do this providing there is enough storage space. For example, a four dimensional matrix for 21 categories will require 194,481 cells with the number of digits per cell still to be taken into consideration. Our own estimates indicate that sequence pairs (two dimensional) probably account for about 60 percent of the interdependence between events when our ten categories are involved. It seems likely that even three dimensional matrices will provide much more precision than is needed for most of the comparisons that we have made concerning the teacher's use of social skills.

The Implications of These Comments for Teacher Education and Research on Teacher Education

Condensing the four propositions at the beginning of this paper will provide the starting point of this concluding section. These propositions were concerned with the fewest number of concepts necessary to abstract spontaneous classroom behavior with particular emphasis on the teacher influence. Once identified, these concepts can serve as objectives for designing teacher education programs and can help to establish criteria for the evaluation of teacher education programs. To the extent that these "fewest number of concepts" are valid, they may serve equally well as a guide for the professor of education and the classroom teacher. In both cases the understanding of these concepts must find expression in overt, spontaneous behavior in order to have utility.

Nominations of critical behaviors:--There are a number of behavior patterns that occur in teaching at critical decision points. This will now be mentioned in the same order as they were discussed in this paper, an order that is not meant to reflect on how frequently they occur and on their relative importance to effective teaching.

First, teachers must decide when and why they should turn from providing information and begin to invite student verbal participation by the use of questions.

Second, teachers need to know how to ask broad and narrow questions and to predict the consequences of asking either type.

Third, teachers must know when to restrict freedom of student participation by closer supervision and guidance such as occurs in teacher directed drills and in giving assignments and directions.

Fourth, teachers must know when to support the expression of student ideas and feelings, how to select particular expressions for further development and application, and how to guide such activities without developing unwanted, excessive dependence. Here, dependence refers to the tendency of students to solicit teacher direction and approval in situations in which more self-directing activities should gradually develop.

Fifth, teachers need to know how to make constructive use of the affective aspects of student behavior. Part of motivation concerns the development and organization of positive attitudes and feelings in relation to educational goals and individual tasks. Part of the problem of establishing a free classroom atmosphere involves an objective analysis of negative feelings should they occur. Both positive and negative feelings are involved.

Behaviors such as these are critical because they involve decisions that will have immediate consequences on subsequent interaction. Further, a series of decisions will create a coherent set of expectations, on the part of students, which will linger long once they are established.

Critical behaviors and teacher education:--To the extent that these behaviors are critical in classroom teaching, to this same extent they are crucial in teacher education. The goals of teacher education are revealed as performance in the classroom. The teaching of critical behaviors to prospective teachers will involve at least the following.

(a) It will be necessary to conceptualize behavior patterns AND classroom learning situations.

(b) It will be necessary to develop tools for gathering reliable information about behavior and situations.

(c) The understanding of these tools and concepts will require practice under conditions which helps the prospective teacher transform knowledge into their own spontaneous behavior.

(d) Valid principles to guide critical decisions can be discovered once concepts and tools are at hand. Teacher education, in part (or in whole), consists of creating situations in which education students can discover these principles.

Research on teacher education:--The most informative research on teacher education will be concerned with co-ordinating some aspect of teacher training with some aspect of teaching performance, that is, with evaluating classroom teaching. Fortunately, knowledge of effective classroom teaching is also applicable to the design of teacher education programs.

Systems of interaction analysis can be used as a research tool in evaluating teaching performance and as a training device for prospective teachers. In both instances what occurs as behavior is the prime object of study.

Any taxonomy of teaching behavior will necessarily consider behavior in terms of the situation in which it occurs and the objectives which are presumed to exist. Such a taxonomy must provide concepts for classifying classroom learning objectives and the students' perceptions of these objectives. Given these, the taxonomy must also include concepts useful for abstracting teacher behavior and another set of concepts useful for abstracting student behavior.

Research on teacher education that will be of most help in improving our programs will show whether prospective teachers understand concepts for abstracting the characteristics of learning situations, teacher behavior and student behavior. It will show whether or not this understanding can be inferred from the overt classroom behavior of the beginning teacher and whether or not his behavior is consistent or inconsistent with a set of principles of teacher influence. Finally, it will show whether relationships exist between the foregoing desiderata and events that take place in the teacher education programs.

THE UTILIZATION IN EDUCATION OF KNOWLEDGE DERIVED FROM RESEARCH ON LEARNING

Robert M. W. Travers
University of Utah

The relationship of the entire discipline of psychology to the field of education is a temptingly important matter to study, but the vastness of the problem makes it necessary to restrict this paper to a problem more limited in scope. The purpose of this paper is to consider the nature of knowledge in that part of the discipline of psychology known as the psychology of learning and the implications of that knowledge for educational practice.

The psychology of learning can be represented by a universe of propositions related to events occurring in situations involving learning. The relationship of these propositions to empirical evidence shows great variation. Some are direct statements of empirical findings while others are derived from a body of findings and represent an attempt to formulate general propositions which are true for a defined universe of specific situations. An example of a proposition which is closely tied to an empirical finding is the following: "Ebbinghaus' data showed that syllables near the beginning and end of a list were more easily learned than those near the middle of the list." Such a proposition is to be contrasted with one which does not refer to a specific instance such as, "A reinforcement will decrease in effectiveness with increasing delay between the reinforcing event and the behavior upon which it is contingent." The latter proposition is an attempt to formulate a generalization which is believed to be true for a defined universe of events. Such propositions are generally referred to as laws and the limits of the universe of events to which they can be applied, for making predictions or exercising control, are referred to as the boundary conditions of the laws.

The situations from which the propositions are derived show great variation in the tasks involved, in the subjects used, and in the antecedant conditions which influence the outcomes. Some of these situations are found in laboratories. Some are naturally occurring and involve learning as it occurs in schoolrooms. Some of the propositions included in books on the psychology of learning are based on common observation and do not reflect systematically collected data. Thus while the psychology of learning consists of a hard core of propositions such as scientists derive from carefully collected data, there is also a large and hazy fringe of information rooted in common observation and folklore.

The lack of a sharp distinction between the core of propositions which constitute a science and the fringe of folklore with which it is surrounded raises difficulties in discussing the psychology of learning and its application to problems of human learning. In the physical sciences there is no tapering off of scientific knowledge into popular information. Newtonian mechanics is a well defined core of principles and axioms devoid of any contamination of the popular notions about matter held by the public in Newton's day. The fact that there is difficulty in finding the dividing line between the solid core of established information and the peripheral area of folklore has many unfortunate consequences. One of these is that what is really folklore is often presented to students of education as if it were well-established scientific information. Another is that textbooks on educational psychology sometimes present little except the peripheral popular conceptions on learning. Not all do this, but one of the most widely used is of this character, and would appear to leave the student almost unaware of the existence of the inner core of scientific knowledge. That such a text is widely used is hardly surprising in view of the fact that most instructors who use it have had little scientific training in the behavioral sciences.

Much educational theory has also been based on the peripheral propositions. For example, the reforms which Froebel attempted to introduce into education were based on a conception of learning derived much more from theology than from any body of knowledge resembling a science of behavior. Another example is found in progressive education in the thirties which derived many of its learning concepts from Jean Jacques Rousseau. Such theories of education were evolved before there existed much in the scientific core.

A question to which an answer will be attempted here is whether such a dependency of educational theory on what is believed to be common knowledge about learning should be tolerated today, or whether the core is of such an appropriate and substantial nature that it can form a sound basis for educational practice.

First let us consider the typical difference between the propositions which constitute the core of knowledge about learning with the propositions representing the periphery. The periphery is characterized by such statements as the following:

Learning is more effective if it is meaningful to the learner
Children learn best in a stimulating situation
Children learn what interests them better than what does not interest them
Children have a need to learn
Children need for approval for their work

Examples of scientific propositions about learning cannot be so easily and glibly given. Such propositions have to be supported by a set of definitions of the terms included in them. In addition, insofar as they are generalizations, the boundaries of the conditions to which they apply need to be specified. Indeed, one of the errors committed by educators in the application of the inner core of propositions to educational problems is that of ignoring boundary conditions.

An attempt to build a core of scientific knowledge about learning has had a long history which has demonstrated many changes in strategy over the years. A scientific psychology of learning which relates, at least indirectly, to education may be considered to date back to the work of Ebbinghaus, though in fairness to him one must say that educational reform was not his intent. Ebbinghaus (1850-1909) derived the impetus for his work from his contact with the work of Fechner on sensation. While his initial efforts were those of adapting the quantitative methods of Fechner to the study of higher mental processes, his ingenuity and resourcefulness soon led him to develop novel approaches to the quantitative study of complex processes. Of special importance in the present context is his recognition of the fact that the direct attack on problems of learning as it occurs in natural settings was unlikely to yield knowledge of any great value and that learning had to be studied under artificial conditions. In this respect he introduced into the study of the higher mental processes the conception of science which had proven to be so productive in the physics and chemistry, namely, that the study of phenomena under simplified conditions yields knowledge which can be generalized to some degree to what we judged to be related phenomena occurring under more complex conditions. Ebbinghaus himself never became particularly concerned about the extent to which the laws which he had discovered had broad application or had boundary conditions which limited their scope. Like the other great scientists of his generation, he wrote of his discoveries as if he were making the implicit assumption that what was discovered was ultimate truth which had few limits placed on its generality. Only much later did the issue of the generality of knowledge achieved about learning become an important one, and one which has produced a deep cleavage between those involved in education and those involved in the advancement of knowledge.

The propositions which derived from his work are stated as laws relating such factors as the amount of learning to length of material and number of repetitions. Many of the propositions pertain to memory and include the description of the typical curve of forgetting, the effect of learning associations in a backward and forward direction, and the effect of spaced versus massed trials.

The propositions which are the outcomes of the work of Ebbinghaus are not simply a miscellaneous group of findings but rather do they fall within a structure which is that of associationism. The propositions are assumed to have considerable generality and are stated as though they applied to material other than nonsense syllables and other learning situations than those occurring in the laboratory. In actual fact, this implicit assumption of Ebbinghaus was correct, for subsequent work has shown the extraordinary generality of many of the propositions derived from his work and they still form part of the core of scientific propositions to which reference is here made. It is a monument to his achievement that his discoveries have formed such a permanent part of scientific knowledge. While the propositions have been retained, the structure which held them together has long been

The Coming of Comparative Psychology and the Problems of the New Era

If those who followed Ebbinghaus had stayed in his footsteps and remained with the study of human learning, many of the problems which at present exist in relating knowledge of learning to education would not exist, but the turn of the century brought with it a new generation who were influenced not so much by the philosophical tradition of associationism as by the new tradition of biological knowledge which had grown in the hands of such men as Charles Darwin, Thomas Huxley and Johannes Müller. From the minds of such men had emerged the concept that organic evolution results in increased complexity rather than in the introduction of new and novel functions. The emergence of the new science of physiology was dependent upon the truth of this assumption for it justified the physiologist in collecting information on functions of lower organisms and, within limits, applying them to higher organisms. The earlier work of Harvey on the circulation of the blood, though antedating the doctrine of evolution, had clearly made the assumption that the study of circulation of the blood in subhuman species provided knowledge concerning the circulation of the blood in the human body, but it was not until the latter half of the nineteenth century that some justification was provided for this kind of generalizing in the form of evolutionary doctrine. Here was opened up an entire new approach to the development of knowledge, and an indirect approach to the development of knowledge about men. Just as Galileo had opened up a new era for physics by approaching the study of falling bodies, not under conditions of free fall, but under conditions provided by the inclined plane, so too could the scientist now obtain insight into biological functioning, not by studying the human organism directly but by studying much simpler organisms.

The study of behavior was soon to come under the impact of this powerful new approach to the expansion of biological knowledge, but the impact also brought new problems which, in their present form, are the basis of the difficulties underlying the relationship of the knowledge available today concerning learning and educational practice.

Darwin himself saw the possibility of studying behavior from a comparative approach and his Origin of the Species is replete with illustration of behaviors which have survival value for a species. While much of his evidence would not be accepted today, it represents a foundation for subsequent comparative studies. The trend in this early thinking was to emphasize behaviors in which learning was believed to play only a minor part, a trend which was evident in the work of Lloyd Morgan.

Just as the physiologists of the early nineteen hundreds had no questions that the discoveries that they made concerning the functioning of the body could be applied to the understanding of human physiological functioning, so too did the new generation of behavioral scientists have the same faith. Pavlov in the Old World and Thorndike in the New began to attack problems of behavior, selecting for study those organisms which were readily available and which made convenient laboratory specimens. Pavlov had already spent half a lifetime in conducting studies of the nervous system within the new emerging biological tradition of comparative studies and evolutionary concepts. His turning to the study of behavioral phenomena appears to have been a result of his contact with the writings of Sechenov (Translated 1956) and also, according to Boring (1950) he had seen the early writing of Thorndike on animal intelligence (1898). The tradition established by Pavlov with its unquestioned assumption that behavioral phenomena discovered with lower organisms can be generalized to the higher became the foundation for modern Russian psychology.

Although the comparative approach to problems of learning is commonly rejected by persons connected with professional education, the ironical fact remains that educational psychology as it emerged in America during the present century had a firm footing in animal studies. While Thorndike does not seem to have come under the influence of the new biological tradition while he was undertaking his undergraduate studies at the Wesleyan University, his primary interest at the graduate level was in studies of animal intelligence. Although his undergraduate studies were mainly literary in character, his main interest in psychology emerged after reading James' Principles of Psychology, volumes which are primarily focussed on human psychology. However, the young Thorndike was encouraged by William James himself to study animal problems. This encouragement went even so far as James offering the young Thorndike the use of his basement for animal studies after Thorndike's landlady objected to the presence of pesky subhuman subjects.

Thorndike's connection with education seems to have been an occupational accident rather than anything which he himself had deliberately planned. The fact of the case is that James McKeen Cattell was able to arrange a junior appointment at Teachers College, where Thorndike went on to spend his entire professional career. While Thorndike brought with him to Teachers College some of his more educated chicks, his work there began to show a change, for it involved the extension of his research to problems of human learning. It also involved, and this is a very important historical point, the application of the principles of learning discovered on subhuman organisms to the understanding of the behavior of human learners. Thorndike himself clearly recognized that his studies of animal learning formed the foundation for his work with human subjects and, when he came to write his famous Educational Psychology the discussion of then current knowledge of learning phenomena is introduced by a chapter on research with animals. A modern writer in the field would hardly dare utilize such material because of the prevailing notion in education that only studies of human learning can possibly have relevance for understanding human learning. For the modern educator the doctrine of evolution and the comparative approach to problems of physiology and psychology to which it gave a rationale, might just as well not exist.

A very important point to bring out here is the fact that every major influence exerted by Thorndike on education, and he exercised the influence of a giant, had as its foundation his early experiments with animals. Even such practical matters as word counts, with their vast application to the design of educational materials, find their roots in Thorndike's early observation on the effect of exercise and rewards in animal learning. I am not saying that Thorndike was rash enough to generalize from animal experiments to human behavior, for his early experiments on creatures ranging from chicks to primates were virtually all repeated with human subjects. He did, however, (1913, Vol 2) make it clear that he believed that complex processes were built on simpler processes and that a convenient place for acquiring some understanding of the simpler processes is the animal laboratory. This position makes the fundamental assumption that there is continuity between the behavior of subhuman and human behavior.

Thorndike laid the foundations not only of educational psychology in America but also much of American experimental psychology as it is known today. Indeed, for a decade his work was all there was of experimental psychology on this continent. Yet the odd fact is that animals experimentation at Teachers College had a very short life and never acquired even a foothold in other graduate schools of education. The reason is the fairly obvious one, namely, that the lack of knowledge of human learning was such in the early part of the present century that any contribution involving human subjects must have appeared to be a worthwhile endeavor.

While the comparative approach involving animal experimentation played a crucial part in the development of Thorndike's ideas, he also utilized another approach which has been largely rejected by educators. The latter is the approach to the study of learning which involves experimentation in simplified laboratory situations. This is nothing other than the great scientific tradition of the physical sciences, and a tradition which has produced much of the knowledge on which our present civilization is based. Thorndike was a prolific experimenter, and so prolific was he that he referred to his experiments by number rather than by name. His experiments with human subjects involved such situations as guessing which number from one to five, the correct association with a particular word, and other simple association tasks. Very few of his experiments ever involved situations which resembled more closely those occurring in classrooms. The nearest he ever came to the latter were some studies conducted as a part of a major enquiry into adult learning in which he investigated the acquisition of high school subjects by adults of various ages. For Thorndike, experimentation in realistic situations similar to those which occur naturally in our civilization was not a major avenue to advance knowledge of human learning.

The Parting of the Ways - Comparative Psychology and Educational Psychology

If Thorndike had continued to pursue his work on learning with subhuman organisms at Teachers College, the history of the subsequent relationship between the psychology of learning and education might have been very different from what it is and has been. What actually happened was that research workers in education confined their efforts to the study of learning in situations which resembled the classroom while psychologists outside of the field of education developed programs of research involving laboratory situations generally designed for use with subhuman subjects. The availability of laboratory animals coupled with the almost unlimited possibility of controlling the background which they bring to a particular experiment has made them the preferred subjects for laboratory experimentation.

Research on animal learning as it has been pursued in American laboratories has produced a vast amount of information about learning, but the expansion of knowledge has also brought with it an expansion of the technical vocabulary. The result has been a divergence of the data language of the learning psychologist working in the laboratory and the data language of the teacher and school administratory. The divergencies of the data languages involved today are such that communication between these two groups is hardly possible, unless by some strange chance the one has managed to acquire the language of the other. The barrier which has thus developed is a real one with unfortunate consequences. The educator tends to rationalize his inability to understand the data of the experimental psychologist by saying that it has no relevance for education. The experimental psychologist, in turn, is likely to take the position that the important implications of his findings have been slightingly disregarded by school people.

Attempts to Structure the Propositions Representing Knowledge of Learning

While the peripheral propositions related to learning which are derived from common knowledge show little organization or structure, persistent efforts have been made by psychologists to organize those derived from systematic research. This generally involves a two-step procedure; first the empirical findings from each of several studies are restated in terms of general propositions which refer to a universe of similar situations, and then the latter propositions are organized within a structure. The organization or structure within which the propositions can be arranged is referred to as a theory. Attempts to provide such structure represent, to a great extent, the history of systematic or theoretical psychology. Insofar as such a structure or organization can be found and justified, the power and usefulness of the propositions involved are immensely increased.

The classic and familiar illustration of the reduction of a vast body of fact and observation to a few summarizing propositions is found in Newton's Principia. The body of empirical information available to him was vast and had its roots both in astronomical observation and in the common observations of daily life, but the facts, as they stood, were almost worthless. What Newton was able to do was to find a limited set of propositions of which all the specifics in the overwhelming body of knowledge available were examples. The propositions thus derived, referred to as the _Principia_, thus provided not only a simplified system of knowledge but an overwhelmingly more powerful one too. The _Principia_ permitted the making of predictions with a precision quite unattainable before their publication. The _Principia_ also permitted the control of natural phenomena involving mass, motion and time, in a way which opened up an entire new era in the design of machinery.

The _Principia_ not only formulated knowledge in a way which permitted improved prediction and control of events but it also had another very important consequence. The new knowledge, because of its precision and conciseness, became much more readily taught to a new generation. While a man might have spent years in mastering the scattered empirical information on which the _Principia_ were based, the new knowledge could be mastered in a matter of days or, at the most, weeks. The organization of knowledge brings with it a certain teachableness, which unstructured knowledge generally lacks. In addition, the system does much to specify the conditions under which the propositions can be applied to the solution of real problems. Newton was certainly aware of the problems involved in the application of a system of ideas and did not just live in an ivory tower. As a matter of fact he applied his own principles to the design of a bridge over the River Cam at the back of Trinity College where he worked and the bridge still stands today.

Another example of the structuring of knowledge results in both the extension of knowledge and the simplification of it is found in the work of Mendeleev and the appearance of the periodic table. Once this development had taken place the elements could be ordered according to their properties and the properties of even unknown elements could be predicted with accuracy. From that time on every element did not have to be studied as a separate entity but as a part of a group of elements with common properties. Now the important point to note is that any ordering system, whether it be a set of principles or other ordering device, serves the purpose of replacing a large number of propositions by a few. From that point on, each one of the original large number of propositions is merely an illustration of one of the new compact set of propositions and has illustrative value only.

Every psychologist who investigates learning phenomena expects that his findings will fit into some system of ideas; generally a system guides his research in the first place. For Ebbinghaus, the structure within which his findings were to be interpreted were those of associationism as it had evolved in the hands of British empiricists, but his system was a limited one covering only certain aspects of verbal learning. The modest goals of Ebbinghaus are, perhaps, to be contrasted with the claims of his successors of the first half of the next century each one of whom assumed that his theoretical system had some universality in its application. Unfortunately, educators still think in terms of these later attempts to build universal frameworks into which a large proportion of the empirically derived propositions about learning could be considered to fit. The fact that such systems, and even system building in itself, are considered passe by most psychologists, does not seem to deter the writers of books on curriculum from stating that they endorse a certain theoretical position in learning and that the particular position is more useful for planning educational practice than is any other. For this reason brief consideration must be given at this point to the nature of the conceptual systems which dominated the psychology of learning a quarter of a century ago and why some of these systems continue to dominate the educational scene today despite the fact that they belong to a past era.

In the history of science, theoretical systems typically emerge after a substantial body of empirical knowledge has already become well established. It was in this same tradition that key psychologists in the early part of the present century began to attempt to organize within conceptual systems the empirical information which had been accumulated about learning since the turn of the century. In a way, this could be regarded as a procedure typical of the tradition of science - an era of data collection followed by a period of structuring - but it also showed certain remarkable differences. One important difference was that the system builders in psychology in the thirties tended to derive their theoretical constructions from a very limited domain of behavior, but typically claimed that their system had universal application to learning phenomena. An exception is found in Hull's systematic approach which he regarded as a miniature system despite the fact that some of his followers did not see it as having such limited scope.

Thorndike's early data were based on subhuman subjects, but his later experiments were conducted very largely with verbal materials in which associations were developed under various learning conditions.

The material is such that an associationist interpretation, or the connectionist version of it, can be fitted rather well to the material. Though Thorndike wrote in the last major presentation of his system (1940) as though it were a systematic approach which applied to all aspects of learning, the fact is that the associationistic approach to problems of learning survives today mainly among those investigators who are studying similar kinds of phenomena to those which Thorndike studied. The work of Underwood and Schulz (1960) is a good example of the retention of the essential elements of the Thorndike or associationistic interpretation of verbal learning, but no effort is made by these contemporary authors to claim that the conceptual system has universal application to problems of learning. Other systems of the thirties were also based upon data pertaining to a very limited area of learning. The gestalt psychologists derived their conceptual system mainly from the study of visual perception, but generalized their interpretation to every area of behavior including maze learning. History has preserved the findings of gestalt psychology but the generalizations based upon them have either been discarded or have been retained as generalizations relevant to the understanding of limited aspects of perception only. Much the same could be said about the field theory of Kurt Lewin with his interest in approach and avoidance learning phenomena and his emphasis on the context of learning, but an attempt to apply the interpretation to verbal learning is, at the best, forced. Here again,the extraordinary body of empirical findings left by Lewin have survived and some of his conceptual system has remained as a means of structuring certain limited phenomena, particularly social phenomena.

The global theories of learning of the thirties have come to be regarded by professional psychologists, not as global theories, but as more limited theoretical formulations. But those concerned with education continue to regard them in an entirely different light. The typical book on curriculum regards them as positions from which one has to make a choice. The position that one has to take sides and choose one global theory rather than another hardly seems to be a reasonable one, particularly since what are assumed to be global theories are really not global at all. Current educational thought makes gross misuse of the theoretical positions of a past era.

The behavioral sciences have hardly yet reached the point of replacing the vast number of empirically based propositions by a few precise principles. The theoretical systems of the thirties were attempts to do this, but they were unsuccessful attempts in this direction. One of the difficulties was that the propositions constituting the systems were not clearly related to data. Indeed, the fact was that often the same data were used to support opposite and conflicting positions. Certainly, it can be said that the propositions which constituted the systems of psychology of the thirties did not fulfill the task of replacing a mass of empirical statements of fact by a limited set of principles. The effort did not result in a simplification of knowledge but rather did it complicate matters by introducing controversies of a highly technical and fruitless nature.

The proper use of theoretical formulations of learning in education is for the making of predictions of how certain procedures will work out in practice. The curriculum planner must make a prediction of the extent to which certain conditions will facilitate the accomplishment of certain learning objectives in pupils with specified characteristics. All curriculum planning is based upon the assumption that such predictions can be made, but the basis for the prediction in specified instances is rarely given. Most global theories of learning are quite unsuited to the making of such predictions. What could one ever say about the value of a particular method of teaching French vocabulary from a knowledge of Gestalt psychology? How could one obtain a comparison of the effectiveness of two methods of teaching long division from a knowledge of Lewinian field theory? Of what use is a Thorndikean connectionist theory to an understanding of how perceptual discriminations are learned? These are, of course, all the wrong questions to ask. Gestalt psychology has almost nothing to say about verbal learning. Lewinian field theory provides no propositions that have anything to do with the learning of arithmetical procedures, and the connectionist theory of Thorndike has virtually no contribution to make to problems of form perception. On the other hand there are questions which can be appropriately asked of all of these systems. Gestalt psychology has something to say about form perception which can be applied to the planning of learning to read. Lewin's system has much to offer in predicting what will happen when there is conflict between the child's desire to obtain information from the teacher and his fear to approach the teacher. An associationist psychology, or an associationist psychology in a connectionist form, has much to offer for understanding the problems involved in the acquisition of vocabulary. All the systems of the thirties were based on particular categories of psychological information and the general propositions derived from the data are appropriate for answering questions related to similar data, but are largely inappropriate for answering questions pertaining to very dissimilar domains of behavior. The demands which educators place on the conceptualizations of learning produced in the thirties are generally unreasonable, if not ludicrous.

Even when appropriate uses are made of the conceptualizations under consideration, one can hardly expect them to answer the most far reaching questions of education. The questions that can be answered are likely to have much more to do with the most effective ways of achieving specific objectives than they are with global policies concerning curriculum planning or the achievement of the "cardinal principles of secondary education" (1918). This again produces a problem because the typical writer on curriculum is much more likely to be interested in the large and global problems than in the details of achieving very narrow and specific goals.

The flirtation of education with psychological learning theories has not been a fortunate one. Despite the fact that education and field learning theory have sworn eternal fidelity, neither seems to know what the partnership is expected to produce. The fact is that the flirtation has never reached beyond the hand-holding stage--innocent and quite unproductive. A wedding of learning theory and educational practice would mean that every attempt to formulate a curriculum would involve a clear statement of the objectives to be achieved, a statement of the learning principles most appropriate for planning the achievement of the particular objectives, and procedures for applying the principles within the framework of the particular content implied by the objectives. This is a far cry from the usual ritualized bow to some brand of learning theory which is the first and last recognition given to it within the entire curriculum plan.

But such a wedding of education and a comprehensive learning theory is not a possibility of the present, but a dream of the far off future. At the present time it appears far more of a dream of the future than it did in the thirties when there seemed to be some possibility that a comprehensive theory of learning could be formulated. Even without the existence of a reasonably acceptable comprehensive theory of learning, there are great difficulties involved in applying knowledge of learning phenomena available to educational problems. Some of these problems need to be considered at this time.

The Miniature System Approach

While writers in education continue to write as if one had to choose an allegiance to a particular theoretical position with respect to learning, scientists engaged in research on learning phenomena have long realized that global theories were not successful enterprises. The one exception to this has been Mowrer (1962) who has continued to attempt to integrate all knowledge in the area into a single conceptual framework. Other psychologists have been critical of this attempt to develop a new all-encompassing theory on the grounds that it is, like other and earlier systems, far too ambitious an effort which is bound to lead to failure in the present state of the science.

An alternative approach at the opposite extreme has been to abandon theory construction entirely, a position which Skinner (1956) has virtually taken. A more common approach has been to develop miniature theoretical systems which cover only a limited range of phenomena and which are tied closely to limited data. The late Clark Hull (1935) is generally considered to be the man who developed the concept of a miniature system, and he referred to his own theoretical formulation as just that. Spence (1956), who was perhaps Hull's closest associate, found even Hull's system too broad and developed his own theoretical formulations within parts of it. Other psychologists have tended to follow suit. The organization of knowledge within limited areas of learning, generally involving specific classes of learning tasks, has become typical of the research scene and of the research literature. Many examples can be cited. The work of Underwood and Schulz (1960) is an illustration of one such program. Another is the work of Hebb (1958) and his associates at McGill University on the effects of sensory deprivation on subsequent learning. Research on the learning of psychomotor skills is another area of limited scope in which an attempt has been made to bring order into the data and provide limited theoretical formulations. Still another example is found in the area of perceptual learning and in the structure proposed by Solley and Murphy (1960). All of these represent the structuring of limited experimental data and without any pretensions that the theoretical formulations have generality throughout the field of learning. Such formulations are commonly described as miniature systems.

The advantage of such systems is that they stay close to a limited body of data, but in turn they have the disadvantage of being applicable to only a limited range of phenomena. They generally attempt to draw conclusions from data with much more care than has been the case with the development of the global systems of the past. The most elegant of such miniature systems is that developed by Hull mainly on the basis of data derived from maze learning behavior in rats, but the deductions which are drawn from the data are very cautiously drawn and the throughgoing attempt to quantify phenomena and to draw quantitative conclusions represents a great advance over the looseness of the earlier more comprehensive systems of the previous decade.

The tendency to develop miniature systems has been profitable but the resulting reduction in the complexity of information has been only limited. For example, while much of the data on verbal rote learning can be replaced by a set of propositions representing learning principles, the reduction is not as dramatic as was the case when Newtonian physics replaced the vast medley of observations which had accumulated during the previous centuries. Mastery of the knowledge available still requires the comprehension of a large number of such subsystems of knowledge, many of which are highly restricted and cover very limited phenomena indeed. Since the principles which such miniature systems provide are still not as tightly tied to the data as would ultimately hope them to be, some knowledge of both the data and the derived principles is necessary in order to determine possible applications. This, in turn, places a serious burden on the person in education who wishes to apply what is known about the psychology of learning but who cannot devote extensive effort over many years to the mastery of available knowledge. To fall back upon the simplifications of knowledge attempted in the thirties is no solution to this problem, though it may give the persons involved a feeling that knowledge is being applied by doing so. This is a dangerous illusion and one which is likely to interfere with the appropriate application of knowledge.

The organization of knowledge about learning within very restricted data areas has generally taken place with respect to learning problems about which educators are not too concerned, if one may judge from the emphasis given to them in books on curriculum. For example, verbal learning tasks involving rote learning are good examples of tasks which have provided data amenable to structuring and organization. The implications for school learning lie in such areas as the learning of native and foreign vocabulary and in other tasks involving rote verbal learning. The results have no implications for those learning areas which are so dear to educators such as critical thinking, creative behavior, and so forth. Despite this conclusion, one is still left with the suspicion that the application of psychological principles to the acquisition of some of the knowledge learned in schools might, nevertheless, produce important gains.

The emergence of miniature systems should have changed the relationship between education and psychology, but it did not. Textbooks on educational topics should have shown an awareness of this change nearly twenty years ago, but they continue to be written as if the science of learning had not progressed for two or more decades. The utilization of modern knowledge requires that the writer of such a book have a detailed knowledge of a kind which was hardly required when one or another comprehensive theory of learning was accepted and all curriculum planning was in some way to be influenced by the theory. The application of knowledge derived from miniature systems requires not only a detailed knowledge of the system itself but also of some understanding of the data on which it is based, for the latter knowledge provides an indication of the classes of phenomena to which the miniature system can be applied. Such a detailed knowledge of learning phenomena is rarely found among those engaged in teacher training either at the graduate or the undergraduate level. Probably one can hardly expect such detailed knowledge for the research literature on learning is vast and the annual contribution of new studies is in the hundreds. It is almost necessary for a person to work full-time in the field of learning for him to have familiarity with the current state of knowledge.

What appears to be needed is for each teacher training establishment to have at least one person on the faculty who is interested primarily in the area of learning and who will devote much of his time to keeping up with knowledge. Such a person could advise on matters of applying current knowledge to problems of education.

Despite the fact that the present trend is to avoid the development of global theories and the vast overgeneralization which such theories imply, some psychologists continue to engage in overgeneralization from limited data. This is a somewhat different kind of sinfulness from the overgeneralization through unwarranted theoretical developments but its effects on education can be just as disastrous. Two main areas of psychological research illustrate this indecent tendency at the present time; these are the areas of reinforcement and creativity which have provided the greatest scope for those who like to engage in the overgeneralization syndrome.

While one can hardly deny that the concept of reinforcement has had an important influence on psychological research in the last two decades and the concept has been useful in planning certain kinds of learning situations, it is also quite evident that the concept has limitations in its application to organisms that have the independence from time conditions which humans have. Human beings learn both in terms of responding and receiving knowledge of results or other reinforcements, but they can also learn by receiving information prior to the execution of a response. To plan human learning in terms of the reinforcement paradigm, in which the reinforcing event is contingent upon the response, ignores the fact that human learning is not closely tied to the time conditions which this model of learning implies. While the reinforcement model of learning of the Skinnerian type provides a useful plan for instruction in such areas as learning vocabulary, number combinations, certain motor skills, it does not appear to provide a useful guide for setting up conditions for perceptual learning, for information processing and storage, for many complex processes involving concept learning, for the establishment of learning sets, and so forth. The somewhat disappointing results of research involving the use of teaching machines and learning programs which have emerged in recent years leads one to suspect that all is not entirely well with the model on which such procedures are based. This does not mean that the model should be discarded, but merely that it should be kept within more confining boundaries.

Research on creativity is also an area in which the results of research have been vastly overgeneralized, with the aid, cooperation, and encouragement of professional educators. To some extent this situation has occurred because a few incautious psychologists have been expressing ideas which educators like to hear. The notion that there is a fairly simple way of developing the creative talents of children in the school and that any teacher can perform this remarkable feat does much to flatter the egos of those concerned with teaching. Of even greater popular appeal is the idea which has been hammered by a very few psychologists in popular magazines that a child can have a low level of general intelligence but still be very creative. This is a very misleading statement though, in a sense, it is true. One can certainly take the position that Kohler's chimpanzee (1926) Sultan was a very creative chimpanzee for it did show ingenuity in the making of tools, and it would not have scored very high on the Stanford-Binet test of intelligence. One must also concede that the chimpanzee does not show a particularly high level of intelligence, at least not by human standards. However, one must also admit that the creative talent shown by the chimpanzee Sultan would have done little to help the creature adjust to and live in a complex civilization. A part of the unfortunate black magic of the word creativity is that it derives its magic from its associations with the highest levels of the arts and sciences. This association easily leads one to jump to the conclusion that the dull but creative first grade child may perhaps be an Einstein. The popular writers on creativity have failed to point out that this same dull creative child may be much more like Sultan, the creative chimpanzee.

One cannot blame only a few psychologists for the intellectual indecency of this situation. Those engaged in teacher training and in teaching and educational administration must share the blame. The proliferation of courses on teaching for creativity are, in themselves, examples of how an extraordinary small amount of scientific information can be misapplied to problems of teaching. Any critical reader of the literature on creativity research has no difficulty in recognizing that one cannot legitimately apply the conclusions to problems of teaching. There is probably not enough information available to fill a single lecture on how to teach for creativity, let alone a single course.

One has difficulty in imagining any way in which one can prevent such wild enthusiasm from generating gross misapplications of scientific research. The publicity which this involves is always attractive to a few, but this is not the main problem. A major part of the problem is undoubtedly the fact that teacher training does almost nothing to instruct teachers in the cautious use of research and few, if any, complete teacher training with an understanding that any law of behavior has boundary conditions which limit the use which can be made of it. There is no understanding either of the fact that little generalization is ever possible from a single study, but that knowledge about behavior acquires solidity as experiments are demonstrated to be replicable in different laboratories and as the results of different studies build a unified structure of knowledge. Teacher education has almost nothing to do with the development of these fundamental understandings which can lead to the proper application of psychological knowledge to problems of classroom teaching. Responsibility for the unfortunate situation as it now exists belongs in teacher education.

Teaching-Related Miniature Systems

The miniature system approach has typically involved the development of research on learning with subhuman subjects for reasons which are obvious, but it has not avoided entirely the use of human subjects. When it has involved the latter the learning phenomena studied have been typically the more simple rather than the more complex.

Faced with this situation and the body of information which it yields, many school administrators have pleaded for research which would provide a direct attack on classroom problems. Such a plea is backed by the attractive possibility that miniature systems might be developed within educational contexts which might have direct and obvious application to the solution of significant educational problems. The possibility is clearly a seductive one which one cannot avoid exploring.

The difficulty of evaluating such a proposal is that such a venture has never been undertaken in a thorough going way. One can point to limited studies of one aspect or another of learning in an educational setting but there is little which one might call a program of research on a problem area of limited size. One cannot point to a miniature system based on programmatic research in this area as one can point to the work of Underwood and Schulz (1960) on verbal rote learning or the work of Hebb (1958) on developmental aspects of learning. If one could, then one would have some basis for the evaluation of the procedure but good examples are hard to find if they exist at all. An approximation to such an attempt is found in research on the use of the sound-motion picture for instructional purposes, an area in which there has been extensive research some of which has been of a systematic nature and which constitutes a set of related studies. A particularly notable example of such research is found in the sequence of studies undertaken by Carpenter and his associates at Pennsylvania State University in the decade following the close of World War II.

The series is notable in that unlike so much educational research the sequence of studies constitutes a program and the studies are technically sound. On the positive side, the studies have done much to identify the characteristics of audiovisual devices that make them effective communicators of information. On the other hand, the results must remain closely tied to the materials on which they are based and at least give the appearance of throwing little light on other aspects of the learning process. Perhaps the reason for this is that they fail to build a model of the process of transmitting information to human receivers and give little insight into the nature of the human receiver which makes him an effective receiver of information transmitted in certain ways but ineffective when the method of transmission has other characteristics. Problems such as the latter are very difficult to study using materials which have been developed for instructional purposes.

Research on instructional media, which take the direct approach, are to be contrasted with the results of research which investigate the character of the human organism as an information processing system. Such research, which is illustrated by the work of Donald Broadbent, Alan Moray. Colin Cherry and others, does not use typical audiovisual teaching materials; despite the fact that it involves very simple learning tasks, the outcomes have very important implications for the design and use of instructional materials, particularly those involving more than one sensory modality. Such research has generally shown that the nervous system functions as a single channel transmitter of information which is incapable of handling information from two sources at a time. Incidentally, this model of human information processing is the direct opposite of that which is preached in most books on audiovisual instruction.

Now the model of human information processing which emerges from such research would probably not have evolved from research involving the direct use of audiovisual instructional materials although one must concede that the latter might have eventually evolved such a model. The use of such instructional materials for probing the properties of the human nervous system is about as clumsy as using a butcher's cleaver for investigating how the chicken is put together. A small scalpel designed for the purpose would provide a better approach - despite the argument that butchers have been cutting up chickens for a long time and should have some skill at the task.

Perhaps a case could be made for psychometric research as an example of a miniature system which has emerged through the study of learning in practical educational settings, but while such research has produced useful empirical predictions, it provides almost no information about the way in which learning conditions should be arranged in order to provide the maximum learning. The theory which has emerged from this area is a theory of measurement rather than a theory of behavior and the contribution thus made is an important one. Undoubtedly, it has done much to help identify some of the intervening variables of learning, but how these fit into any miniature learning theory is still largely speculative. For this reason, psychometric research barely achieves mention in most books on learning.

Summary

Our purpose has been to examine the nature of the propositions which constitute the psychology of learning and to suggest how these propositions can be used by those directly concerned with the development of education.

First, the point was made that the propositions vary from statements derived from common experience to statements derived from research studies. The statements from this universe of statements which typically find their way into books on education are more often those derived from daily experience than those derived from research.

The difficulty of applying the central core of scientific statements about learning is that they constitute a very large number and attempts to reduce them to simplified system have not been successful from the psychologist's point of view. The era of attempts to formulate comprehensive theories of learning was during the thirties. During that era many believed that successful and comprehensive theories of learning had been achieved. It is with this obsolete belief in mind that many writers on curriculum tie themselves to one of these outmoded formulations and advocate it as the approach which the student should follow. Such an approach to problems of curriculum construction fails to take into account the changes in the psychology of learning that have taken place in the last thirty years.

The psychology of learning today can be represented by a large number of propositions derived from research which tend to organize about specific problems. This makes mastery of the area of knowledge very difficult, - perhaps of the same order of difficulty as the mastery of knowledge about states of motion and equilibrium prior to the appearance of Newtonian mechanics. Just as the student of that time would have had to face the prospects of studying vast quantities of astronomical data as well as data on projectiles, falling bodies and so forth, which might have taken many years to master, so too is the student of education today faced with a vast amount of empirical information derived from research on learning which he too must master if he is to know the field. Knowledge in the area of learning is much more difficult to master than writers on curriculum would have us believe it to be.

The complexity of knowledge in the area requires that the student of education obtain his knowledge about learning from somebody who is a specialist in the field, that is to say from somebody who devotes most of his time and energy to the study and investigation of problems of learning. More time will have to be spent in this pursuit than has been typical of either undergraduate or graduate programs of the past. Certainly, the ignorance of the psychology of learning evident both in students of education and in many of the books which they read represent a deplorable state of affairs. Teachers largely ignorant of what is known about learning should be no more tolerated than physicians ignorant of physiology. This educational slum right in our own backyard should be cleared quickly.

To ignore the modern body of research literature is no worse than the opposite tendency which is that of overgeneralizing from it. Wild behavior of the latter kind is not compatible with the emergence of a discipline related to education.

Teacher training institutions and graduate programs in education will begin to resolve some of the problems discussed here when they begin to recognize the need for having experts on the staff who have digested the large body of research available and who can make cautious judgments concerning the relevancy of particular research to the solution of particular educational problems.

Bibliography

Boring, E. G. A History of Experimental Psychology, Second Edition. New York: Appleton-Century-Crofts, 1950.

Commission on the Reorganization of Secondary Education. Cardinal Principles of Secondary Education, U. S. Office of Education Bulletin, Washington, D. C.: Government Printing Office, No. 35, 1918.

Hebb, D. E. Textbook of Psychology. Philadelphia: Sanders and Company, 1958.

Hull, C. L. The conflicting psychologies of learning - a way out. Psychological Review, 1935, 42, 491-516.

Kohler, L. Mentality of Apes. New York: Harcourt Brace, 1926.

Mowrer, O. H. Learning Theory and Behavior. New York: Wiley, 1960.

Sechenov, I. Selected Physiological and Psychological Works. Moscow: Foreign Languages Publishing House, 1956.

Skence, K. W. Behavior Theory and Conditioning. New Haven: Yale University Press, 1956.

Skinner, B. F. A case history in scientific method. American Psychologist, 1956a, 11, 221-233.

Solley, C. M., & Murphy, G. Development of the Perceptual World. New York: Basic Books, 1960.

Thorndike, E. L. Animal Intelligence, Psychological Review Monograph Supplement, No. 8, 1898.

Thorndike, E. L. Human Nature and the Social Order, Macmillan, 1940.

Underwood, B. J., & Schulz, R. W. Verbal Learning, New York: Lippincott and Company, 1960.

SOME IMPLICATIONS OF RECENT INSTRUCTIONAL MEDIA RESEARCH FOR THE PROFESSIONAL EDUCATION OF TEACHERS

C. Walter Stone
University of Pittsburgh

The image of teaching was once conceived as simply a process of one individual in a box-like classroom with thirty students engaged in the process of lecture, discussion or practice work. Today the picture is rather different. The image of the future now being projected for teachers in training evolves a major change in roles. One clear expression of such an image has been sketched by Ryans in developing his theory of instruction with special reference to the teacher in terms of an information systems approach --

> . . . It may be that the teacher of the future will become less of an information presenter and more of an organizer of the instructional process. Such a possibility is intriguing, and it can easily fit into the information system theory of instruction. In the future, much heavier demands may be placed upon those persons in our culture traditionally known as teachers or instructors as they become scholars, programmers and controllers, both of the information to be communicated and of the channels (i.e., media) of communication. Increased emphasis in teacher education and in classroom and/or individual learning situations undoubtedly will be placed upon the teacher as an integrator and

> organizer of all the functions described as "teaching behaviors" (i.e., motivating, presenting, organizing, evaluating, and counselling), whether these functions really are performed by a teacher or some other medium or set of media in an optimally organized sequence.[1]

In short, the teacher may be many persons and the act of teaching a complex task involving the organization of learning activities importantly in terms of media.

Instructional media research completed in recent years supports the type of image projected. Effective use of instructional media can be shown in almost every field of educational interest to be capable of improving and enriching teaching, serving more students more rapidly, assisting the conservation of instructional time required for learning, individualizing study and encouraging independent effort.

However, not all experiments involving instructional uses of media have produced conclusive results. One finds in visiting schools and colleges as well as schools of education that all too frequently more time and attention are being given to the mastery of electromechanical contrivances and promotion of their use than to study of the instructional needs and the specific characteristics of content which may suggest new instructional media approaches. But this picture is also changing with the completion of more studies and experimentation concerned with problems of how to bring about change and improvement in instructional practice and related administrative approaches.

Perhaps one of the most significant lacks represented in efforts to use the media for instructional purposes, as it is also in the entire education enterprise, "is the lack of an over-arching philosophy or theory to accommodate such disparate devices as a computer-organized classroom, a one-man study used for television projection, and a language laboratory."[2] This absence of a suitable rationale not only handicaps development of sound instructional service arrangements in the use of new methods in teaching, but has blocked until the present time development of opportunities for teachers, administrators and specialists to obtain full familiarity with instructional media, understanding of related areas of learning and communication theory, and demonstrable capacity for application of instructional media to the learning process.

The aim of this paper is to make explicit some implications of recent instructional media research for teacher education and to suggest a few promising avenues to follow in conducting future investigations. In pursuing this end, I have assumed a general awareness of the changing requirements, goals and structures of the American educational system and plan to recall in only the briefest of terms the changing shape of current programs in teacher education to provide a context for the opinions to be advanced.

I shall review first some assumptions regarding trends in teacher education to enlarge the image projected above and then shall review, from the standpoint of a practitioner, some implications of recent instructional media research for the business of teaching in schools and colleges. Following this general presentation we shall consider instructional media research implications for teacher education as such, and then in closing address ourselves to questions concerning philosophy and the need for a suitable rationale insofar as work just now being done suggests there is unity in fields of instructional media interest. Included as Appendix A is a note on sources of information about instructional media research.

Some Trends in Teacher Education

Reflecting national requirements, teacher education in the United States is changing rapidly today. More emphasis is being given to preparation of teachers on graduate levels. Specialization is regarded increasingly as the proper concern of sixth year programs and beyond. This doesn't mean that education as a subject should or will be divorced totally from undergraduate consideration. To the contrary, the hope is that "the integrity of both liberal and professional programs may be safeguarded by requiring full completion of both programs without curtailment of either . . . Professors of the liberal arts and sciences must listen to (the) argument that education itself must be part of a liberal education . . . You cannot really teach history without teaching important portions of the history of education; nor can the first course in sociology fail to deal with the school as an institution and the class as a social system; nor is the first course in psychology complete without consideration of theories of learning and child development."[3]

According to Dr. Morris L. Cogan, chairman of the Department of Teacher Education in the School of Education at the University of Pittsburgh, to whose thinking I'm much indebted for help in setting forth this projection of trends, the design of new programs will also involve setting up a greater number of partnerships between schools and universities--partnerships which are so devised as to achieve much greater and stronger linkages and interaction between teaching about theories of learning and principles and resolving problems faced in schools.

Another evident characteristic of teacher education for tomorrow will be greater amounts of attention given to preparing individuals for one of several types of new, highly specialized careers. For instance, in Pittsburgh the idea is now being considered that some elementary teachers working in schools that want to experiment with novel plans of instruction in self-contained classrooms might assume responsibilities as chairman of a grade, primary or intermediate unit. Such instructional leaders would be given responsibility for establishing close communication among otherwise independent classrooms, for developing new programs of instruction, writing and evaluating curriculum materials, and for encouraging and helping teachers within their group to invent new departures in method, to translate new competencies and special talents into exciting and rewarding careers for themselves.

Another new type of teaching career may be opening up to individuals especially trained to work in large cities. In particular, there is a need for individuals ready to work in economically depressed areas. The preparation of specialist-teachers for such work will include the study of urban sociology; acquisition of knowledge concerning.the morals, customs and beliefs of minority groups, tec. Such individuals may also become leaders in writing the special programs and inventing the special methods needed for teaching children of migrant workers.

The future also suggests a number of other new careers for teachers including opportunities for those having special interest in instructional uses of television, for those who are ready to accept responsibility for developing programs for teaching machines, and for specialists in managing media service. There is also the probability that many new teaching careers will develop in fields related to research, and again, special training must be offered. Such careers promise to be rewarded well. No longer can schools assume responsibility only for instruction per se. They must also work for the improvement of instruction just as better hospitals devote themselves equally to care of the sick and to improvement of medical practice.

The improvement of instruction in and by the schools means that more testing and research must be carried on in the schools. Basic research cannot be completed only in the universities, tied up in a neat package, and then delivered to the schools ready for use. The magnitude of problems that must be faced in terms of testing curricula, devising, for instance, new programs for machine teaching, and research in educational methodology--all require a specially prepared corps of teacher-researchers.

Another set of new careers is likely to grow out of team teaching experiments including some yet to be invented. For example, while some individuals must be prepared as highly-skilled presenters of content; others must be equally skilled to take over the instructional responsibility as listeners who can establish rapport and confidence with pupils and then press for personalized significance in content which another teacher has first introduced.

In short, the shape of teacher education is undergoing accelerated evolution involving greater length of the training period and much more study on graduate levels.

There is increasing diversification of curricular paths for recruitment and preparation of specialists for many new types of teaching careers. There will be more direct linkage with operational programs in schools and colleges. And in view of the obvious need for and increasing utilization of improved methods of instruction, more special attention will be given to modern communications technology and its application to problems of teaching.

A Practitioner's View of Instructional Media Research

In reviewing research on instructional media, one might easily be discouraged by a common lack of significance*, too frequent deficiencies in design, and the notable absence of studies needed for testing new methods in the field or which assess the influence of specific arrangements and endeavors conscientiously established to bridge gaps between experiments conducted in laboratories and practical applications needed in schools. Also conspicuously absent, at least in terms of numbers of projects, are basic studies of motivation, transfer, research methodology, etc.

Granting all deficiencies noted, when the body of instructional media research is reviewed from the standpoint of a practitioner--that is by a teacher or specialist working in a school or college to improve the quality of instruction, or instructional media service arrangements, or by someone responsible for producing new instructional materials and devices--the studies regain considerable stature. Indeed, there have been perhaps several hundred useful studies completed during recent years which may be considered to have value. For, as the practitioner thinks about education, he is now looking ahead to a day (probably less than 20 years from now) when the U. S. population may number 270,000,000 or more and when something like 3/4 of the increased American public school enrollments will be concentrated in fewer than 200 metropolitan centers. Faced with the changing nature of modern society (created by the burst in technology, world-wide explosions in population, etc.), if given adequate opportunity to become fully aware of possibilities, the practitioner can see much promise in the new technology of instruction and in supporting research data regarding its worth in applied situations. At the risk of repeating some information already well-known to specialists, it may be worth a little time to review what the results of instructional media research imply regarding formal instruction generally before we consider more specific implications for programs of teacher education.

---

* In the spring of 1962, Edling compiled a listing of central research questions asked in the first 170 projects supported under Title VII of

Instructional media research completed in recent years has provided much new information regarding the use of print, films, and other media as specified stimuli---------i.e., iconic signs, symbols, and reference points. Such studies are aiding discovery of new keys to the understanding of ways in which communication and learning take place whether in response to single stimuli or in terms of synergistic effects.

NDEA. Since this list has not been kept up-to-date (at least by the Office of Education), it may still be the best available source of evidence to use in supporting criticisms of research significance.

In more immediate, operational terms we have learned from media research that today's schools must have immediately at hand for use in teaching the full spectrum of learning and information resources including books, magazines, and other forms of printed material, pictorial and graphic aids, motion pictures, discs and recordings; television and teaching machines. All are needed for instruction as well as for reference purposes. Sometimes many are needed at once, and at others a few or single units will do the job. Especially with respect to materials used directly in teaching, we have learned from research to look upon all available materials and seek out those which can help us directly to achieve a given goal of instruction, individual study or review, and/or classroom presentation.

Studies of media forms and formats, especially in programmed learning areas, have proved valuable not only by furnishing guides to improvement of instructional rates and quality but also in assisting analytic procedures and the diagnosis of specific teaching and learning problems. Programmed instructional approaches are today accelerating rates of learning as well as individualizing study not only in schools and colleges but in thousands of American homes. Programmed learning has proved effective in a very broad range of subject matters including statistics, Russian, music, chemistry, biology, religion and the Humanities, remedial English and engineering. As such, it has obtained notable prominence in educational programs developed for and/or managed by business and industry.

Programmed instructional approaches have recently been extended to include combination with televised and filmed instruction--for instance, at Pennsylvania State University and at the University of California in Los Angeles. Results also show growing use of computer controls, as for instance in the Plato system at Illinois and in the computer-guided programs developed by the System Development Corporation in California. These arrangements not only promise to make available the full range of modern computer technology for storage, retrieval and correlation of instructional information as well as larger data masses, but also for ready change of instructional sequencing and simultaneous recording of student responses to virtually any form or combination of forms of instructional media presentation.

To offer a further comment on research concerned with the study of programmed instruction, it now appears that the more essential of concepts developed which underlie programmed learning approaches may make increasing contributions in team teaching, to ungraded programs, to dual progress activities, and the like. Programming methods have also been tried in other areas of school work--for instance, in the laboratory, in homework procedures, in group discussions and seminars, for investigation, for self-correction, for the teaching of writing, and so on. And it seems likely that within a few years programmed learning approaches may well be judged more significant for general encouragement of improved "educational engineering" and as almost unequaled sources of feed-back from the learning process, for specific contributions made to production of better textbooks and instructional television, motion pictures, and lesson plans, etc. than it will for any uniqueness in the form of programs in themselves or contributions they are likely to make when developed and used in teaching machines. (Simply as a footnote to these comments on programmed instruction I'd also like to endorse the view expressed by several colleagues in the area that some of the skills of good text writing, demonstration, and visual communication have much to contribute to programmed learning.)

Instructional media research completed in recent years has also yielded invaluable data concerning the media as carriers, that is as conveyors of teaching presentations (sometimes in a two-way arrangement using audio and/or TV feed-back circuits). Television can and is being used successfully in teaching the full range of academic subject matter. The assist it can give to education through permitting the sharing of resources has been demonstrated in many parts of the United States and studied specifically in Oregon by the Higher Education System as well as in T.E.M.P., the Texas Educational Microwave Project.

Closed-circuit use of television has indicated high potential for presenting instruction in surgery, dentistry, medicine and psychology, etc. not to mention reading, languages, mathematics, and the physical and natural sciences. More specialized applications of CCTV include teacher and classroom observation as parts of teacher training programs, presentation of review materials, use in presenting standardized examinations, and even for transmission of research documents from central to branch library stations.

Indeed, experimentation with television--and especially with closed-circuit systems--has created a situation in which it now appears the medium might well become a 24-hour carrier of everything from formal classroom presentations to enrollment figures and statistics of local stock inventories, and has shown that design and development of TV services in American schools and colleges will increasingly be conceived as an instructional service program linked directly to data processing, library and audiovisual service agencies rather than in the previous image of a separate TV station.

On the other hand, broadcast TV will continue to reach out successfully to where people are with non-credit as well as credit instruction in adult and continuing education, and it may also be used to continue the work of trying to bridge educational gaps--for example, as between high school and college--and in filling instructional vacuums--for instance, that currently represented in the national requirement for manpower retraining and related problems of family relocation.

And this additional comment concerning research and educational uses of television--we have now reached a stage when studies should no longer be supported simply to prove that television can teach this or that to large and small groups of individuals. The questions to ask about ETV are different ones and very much harder--where does television fit best in the school or college curriculum? How can its utilization be improved? How can its management be helped to be more efficient and economical?

With regard to learning environments, we have learned a lot in recent years from instructional studies concerned with language laboratories and from experimentation involving variation of class schedules, use of new sizes and types of teaching and study facilities, etc.

5

A learning laboratory station is virtually standard equipment today for teaching languages and, increasingly, for the teaching of other subjects including shorthand, music, drama, speech and biology. (A library of audio tapes for use in listening centers is already in some schools and colleges becoming quite formidable in size, and probably a chief policy question now arising is how long such tapes should actually be kept and for what auxiliary purposes they may eventually be used.)

But, of course, the individual study station (or learning carrel) isn't an instructional medium as such. It is simply a place or form of environment designed especially for listening, viewing, etc. which may cluster a variety of media--an environment, incidentally, which according to studies now under way--and one of these is at the University of Pittsburgh, directed by Robert Glaser--may be influenced more significantly and effectively by its actual size, its capacity to isolate the students, one from the other, the design of its control panel, and so on in some cases, more than by what it actually communicates through the use of tapes, films, slides and other instructional materials.

We've also learned regarding environments that school and college instruction isn't always the most effective when conducted in "little square boxes" 20 to 30 feet on a side. We have learned from instructional media research that people having different backgrounds can often learn quite different things at different rates, and some learn much better from one type of material, while others may need very different help. We have learned from research and experimentation that no magic exists in the nine-month school year or in a 40 - 50 to

55 minute class period. We have learned that sometimes people can become more interested in what they're studying and that they can remember much more of it afterward if they work alone and have a brief period for review shortly after initial study (and then receive only occasional guidance by talking informally with the faculty), that others may learn very well indeed from the "give and take" of class discussion; that parental aid in learning languages taught by television is capable of producing excellent results; and that some ideas are mastered easily by very large groups of several hundred or more students. We have learned that unless our educational facilities are made sufficiently flexible to provide the kind of instruction required for extensive use of instructional media, they probably won't be worth the very large and increasingly vast amounts of money they now cost.

Indeed, it is from instructional media research related to facilities that the shape of the future (as I see it reflected in physical terms) is most directly evident. Here is one illustration from the closing paragraphs of an article published in August, 1963 in Architectural Forum Magazine:

> As electronic teaching systems get into ever wider use, the implications for school planning seem clear. Someday entire school systems may be planned around central production and programmed storage facilities which can be tapped through an underground network by students in individual schools. (There are those who suggest the same network for distributing mechanical services and even refills for the food vending machines.)

Learning stations, with their high content of electronic devices, would be ideally suited to low cost factory production, as appliances are today, and portable receiving stations could be plugged into the learning-service network. A computer could schedule periodic redistribution of such units to keep pace with population shifts.

This ultimate flexibility in school planning is strongly suggested by schools being planned today. In adding a science wing to the seven-year old Wheatley School in East Williston, Long Island where relatively new equipment was found to be educationally obsolete, the architects sought a scheme that would insure against rapid obsolescence. What they came up with was a "plug-in" science laboratory with a service network that could be tapped by a wide variety of moving laboratory modules. Designs like this one may soon eliminate the quandary of the school board trying to decide which way education will go in the future. They are, indeed, forerunners of tomorrow's "plug-in" school.[4]

In short, we have learned much in recent years concerning the nature of teaching stimuli as well as the learning process itself. We have learned somethings about optimum media forms and format arrangements--especially from studies of programmed learning, for instance, regarding optimum sequencing, pacing, etc. We have also learned more about the roles instructional media can play as conveyors or carriers of instruction and/or as controls for presentation (e.g., in computer guided instruction). We have learned more about the environments for learning which may be considered optimum. Nor is this all! In the next few minutes, I should like to highlight a number of specific projects completed recently (and some of those still under way as individual experiments without regarding their category) which appear likely to make very significant contributions to improvement of teaching practices in American schools and colleges.

For instance, there is a project which shows the promise of large overlay transparencies when used in teaching English composition and style. As employed by Edwin L. Peterson, the overlay techniques appear to make "commas" as well as "colons" interesting as they flash on and off the screen in colors. And to suggest a subtle but even more important value, Peterson has enjoyed remarkable success in teaching awareness of language organization and style using visual techniques which in themselves spotlight and reinforce reading in a manner calculated to stress the points that are being taught. The Pitt project is labeled "Luminous English", and I think it's a very appropriate name.

We might also talk about use of overlay transparencies in teaching engineering, dentistry, and physics or a thousand other applications now being developed in the elementary and secondary schools or for use in college classrooms. The overlay transparency is a tool which can be animated simply by changing the polarization of light as it projects the transparent image onto a screen and thus creates the illusion of motion, e.g., of the human blood stream or the flow of winds in a high pressure system when the subject is meteorology.

Work being done in Monmouth, Oregon, has suggested some new and exciting approaches to the problem of teacher education using simulation devices. These are devices not unlike the "driver trainer" which place students in artificial environments and present some specific situations usually involving student teacher interaction in which a teacher trainee must respond by choosing among alternatives and actually carrying out a particular course of overt action. Such systems may make very extensive use of slides, films, graphic materials, and recording equipment as well as supplementary printed aids, and they are usually programmed in a very specific sequence which, however, allows for branching and a selection among alternatives.

Use of new split-screen techniques for making comparisons in teaching has been pioneered by various units in the Armed Forces. Since 1961, the University of Wisconsin has featured employment of this technique in its multi-media instructional laboratory. Experiments such as these are most significant in the sense that perhaps they foster learning processes as the result of achieving a new perceptual synthesis. For instance, one might show at the same time in fixed positions several elements and time phases of a demonstration on crystal formation while utilizing the motion picture to show ways in which a crystal changes and final results of a laboratory experiment.

We haven't yet said very much in this paper concerning the motion picture. It may be that during the last few years we've finally learned to stop making instructional films in the image of textbook chapters or sections and to use film more imaginatively--whether we're actually concerned with illustrating dynamic concepts involving motion or inducing appreciation of a dramatic sequence, with creating a mood, or hope to present vicariously with proper editing of time and space some elements in a scientific process.

We do seem to have learned in recent years to use the film with individuals as well as groups. We are also beginning to see the promise of film when used in short clips to portray actions which a student must later verbalize and dramatize into formal language. We also appear to have learned fairly well the worth of motion picture film as a research tool and/or as a record of research performance.

Thanks to the invention of 8 mm cartridge-loading film projectors, we now have the single concept film and probably even more important--the quite remarkable experiments of Louis Forsdale at Teachers College, Columbia University. Forsdale has been developing uses of 8 mm film, which, when displayed on a British rear-screen version of the little Technicolor projector, may, for example, call up direct viewer response in tracing numbers and figures on the screen as a film clip teaches the brush strokes of Chinese calligraphy (which apparently can only be performed in a specific way because of the nature of the instrument used in performing the art). The Forsdale group is also trying out something approaching an 8 mm version of flash card techniques for the learning of simple multiplication. In another experiment, 8 mm film is used in this fashion: a child almost literally plays a game by pointing to that part of a word displayed on the screen which will separate when hyphenated.

Whether Forsdale is right in claiming that 8 mm film is the most important teaching tool of tomorrow because it can now be made available in a form which even small children can use without hurting either materials or machines remains to be seen. The related point he makes is even more significant. We haven't really begun to think of the medium in other than very standard ways; its promise for use in formal instruction is, therefore, as yet almost literally unknown.

Well, perhaps enough examples have now been covered to suggest that from a practitioner's point of view, the results of instructional media research suggest a great deal in the way of potential improvement and enrichment of teaching learning activities. But before moving on to consider research on teacher education as such, there are two additional points I should like to make regarding many current projects and studies.

It is true that we do now have available for use in education a very rich variety of improved and newer media capable of single and multiple use. But, when we consider their instructional values, I believe it may be most important to us--for instance, in the case of television--to recognize that, because of its expensive technology and the unique facility it affords as a carrier, it has been introduced too frequently in schools from the "top down" as a result of administrative fiat. An unfortunate consequence of this tendency could be that the content of American education might eventually be determined more by persons concerned with the technology and mass dissemination of messages and less by professional personnel who are truly knowledgable of and concerned about the instructional needs of youngsters in schools.

The other point is actually one made earlier which I believe now bears some repetition. It concerns the kind of research we've been doing. Researchers themselves admit generally that too much media research suffers from the lack of reference points in theory and a serious lack of precision in specifying criteria which sould be used for measurement. Further in my judgment, the key problems which now must be solved in planning optimum use of E and ITV, as in the case of other new media, aren't very likely to be resolved simply by more expensive support of several hundred discrete studies of the kind most typical of those completed during recent years. The research we need most in ETV, as in other media fields, must be of a kind developed more in sociological and organizational terms which will relate more to educational practices than to the psychological laboratory. To use a simple analogy, in the same way that studies of aerodynamics and carbouretion have little or no direct relation to the influence of jet-age transportation in the world's business and industry (although in a sense one clearly is cause and the other effect), I doubt whether more discrete studies of learning behavior induced by TV, etc., will give us the answers we need so urgently for planning service in our schools or for designing plans for TV administration.

And on reflection, there's still another point I'd like to make concerning instructional media research, experimentation and their implications for teaching practice. We need in the future to be much less parochial and to give more attention to work done abroad. Although new media programs established in Asian countries are restricted to higher administrative levels and don't have opportunity to influence local education, there is considerable likelihood that many Asian countries will have instructional television long before they have developed for schools any very successful programs for use of films, slides, and filmstrips.

By contrast, in Japan which is, of course, an exception and has a very advanced media program, the use of broadcast television is far and away superior to much that I've seen aired in this country. The same in a way can be said about limited aspects of Italian TV and about the potential which is represented in French instructional television, also a nationalized endeavor. The importance of teaching films in Germany and of the co-production plans and projects common throughout Western Europe may be well-known to most in this group. But not all researchers are aware that in the realm of programmed instruction, the French and British are coming along, the Japanese are moving rapidly, and, if recent statements can be believed, the Russians could easily move out ahead.

Research on Teacher Education

The criticisms advanced earlier regarding instructional media research in general apply with equal if not greater force to instructional media research concerned directly with teacher education processes. Too much has been done that's unimaginative. Far too much of it is inconclusive because of inadequate conception and design. Much of the work is overly statistical in terms of measuring group comparability, etc., but inconsequential and, again, too many results remain unapplied. Perhaps as Travers and Lumsdaine have suggested, it is only when reserach ideas become embedded in more concrete instructional projects (e.g., in programmed learning aids) that field tryouts will become more attractive and comprehensivle to persons other than researchers. And as many have suggested, not until more teachers, school administrators, and even members of board and community leaders become involved in general studies of field suitability and in the practical testing of new approaches will the results of instructional media research be directed in greater amounts into the mainstream of education.

Be that as it may, there have been completed in recent years a fair number of studies of instructional media utilization for purposes of improving teacher training. Specific reports on some of these have found their way into professional periodicals, and some fifty-four abstracts were available for retrieval from the research information "reservoir" housed at Western Reserve University. Preliminary analysis of these abstracts serves to confirm three simple points:

(1) Educational media can extend the reach of teacher education, help to enrich the experience provided by teacher education programs vicariously through uses of media, and may serve to improve its efficiency (measured both in terms of uses of time and expenditure

of dollars). For example, closed-circuit television may be employed for classroom observation and through subsequent use of kinescopes and video tapes may assist review and critique sessions of the performance of either a master or student teacher, or of one's own performance;

(2) the motion picture and other audiovisual materials used singly and in combination may accomplish similar ends; and

(3) perhaps a third conclusion may be drawn--When compared with more conventional methods, instructional media approaches are normally equal to and are often superior in terms of measurable outcomes of information retained or capacities developed to perform specific skills, Or, to interpret these research results in more formal language, media instruction is normally as effective (and is often more so) than conventional instruction. Media-based instruction when added to conventional methods is generally more effective than when either approach is used alone. And as a footnote to this comment, most of the research reported has to do with the use of television, kinescopes, or video tapes and with motion picture applications.

More important, however, than results derived from review of discrete studies are the implications of instructional media research "en bloc" and of some studies completed in other related fields. Without citing each specific work, I'd like now to make several points based on reports of research and practical experience gained in working with teachers for optimum and effective use of media on the job.

Evidence gathered in recent years (and in particular from studies on teacher-method interaction) indicate that almost no amounts of instruction in media preparation or use will make a very significant difference in developing teachers who later on make regular and important use of instructional media in their teaching. This finding seems invariably to hold true unless there has at the same time been developed a favorable attitude or self-image regarding such utilization. This self-image appears hard to come by. And, in short, the problem seems to be one of developing through the instructional process a favorable attitude within an individual regarding his own specific roles in that process. (Of course, also involved are the attitudes of planners and administrators respecting teaching-learning activities and a teacher's proper role).

In the process of teacher education, an individual may be so well-trained as to be able to demonstrate at the conclusion of a given training program, high-level attainment of criterion skills. But then when he or she goes out into the field, despite increased availability of all the technical resources, facilities, and equipment needed to capitalize on these skills, he fails to put them to advantage. To cope with the problem, teacher education needs to consider the questions of motivation and attitude more intensively and to define the tasks of teacher instruction so specifically and completely that roles which media can and should play become clear and are fully understood--which brings me to a second point.

Instructional media research has demonstrated again and again the importance of advanced, detailed specification of learning outcomes in terms of operational definitions, i.e., in terms of specific behaviors ranging from simple recollection to performance of complex intellectual or motor skills--behaviors whose presence can be observed and measured in quantitative terms. For a variety of reasons, including tradition and perhaps a very simple and human desire not to be "boxed in", leaders in teacher education often shy away from such procedures. And despite important work which has been done in the area of specifying teacher roles in consistent terms, work represented in studies completed by Ryans, B. O. Smith, et al., the process of teacher education continues to be handicapped by what amounts to refusal by too many who manage these programs to develop operational definitions of desired outcomes (including the necessary changes).

In the future this cannot be excused since such changes in attitude have been proved capable of being attained when proper stimulus materials are used. From recent studies, such as those conducted by Edling, it appears that when careful effort is given to understanding the value system of an individual, there can be developed sometimes by using only a single film (produced in full cognizance of that value system and in a manner calculated not to violate it) major changes in attitude--And this leads me on to a third point.

Instructional media research has shown the importance as well as the feasibility of individualizing learning. Individualization is, of course, both applicable and of special significance to the process of training teachers. Schools and colleges of education must cope with recruitment and training for various levels of service completely heterogeneous groups each member of which can and, indeed, must often be approached (insofar as practicable) with differentiated stimuli in terms of an individual's background, experience, and system. The findings of recent research and media suggest that in every major subject field for which a teacher may be trained an individualized approach can have value. Media programs and combinations of such may be employed with measurable results to show improvement both in the quality as well as in the rate of the learning achieved.

To sum up these points, we know from instructional media research concerned with teaching the importance of specifying outcomes in terms of operational definitions stated in behavioral language. We know the importance and capacities which media have for individualization of learning. And we have acknowledged the importance of individualization in all programs designed for teacher education. We have also seen from a number of recent studies, both those concerned with media and others developed in subject fields, that despite the increasing availability of the full range of learning resources and the gradual but accelerating change in availability of facilities and in administrative points of view, effective use of instructional media depends as much or more than anything else upon a teacher's favorable self-image. Present training in instructional media processes and utilization do not always yield the image required.

And another inference should be drawn concerning teacher roles. It is at least possible, a number of studies imply, that in the future a smaller number of individuals should be recruited to serve as teachers; those who are recruited should be trained better than they have been in the past and in a fashion intended to make them able to make more use of instructional media resources (even to compensate for the lack of other individuals); finally, more assistance should be provided by a hierarchy of specialists trained in instructional techniques who will assist the teaching process. Development of such a hierarchy of instructional service personnel might be compared with developments in the medical profession which have taken place over the past several decades. As one has seen evolve the traditional roles of the general practitioner into a very large and highly deferentiated range of individual tasks relating to medical diagnosis and treatment, so may the teaching profession develop in the future.

To the points made above, there might be added a few footnotes regarding increasing use of instructional media as diagnostic instruments which can help to record the behavior of teachers and students working in natural settings. Also, there should be mentioned the use of media in testing efforts which are well-documented and reported in the literature. Of particular interest to special groups are newer uses of instructional media which do not concern teaching in any traditional sense, but which are both diagnostic and instructional at the same time. For instance, a study now underway at Michigan State University involves the use of video tape in counseling procedures. The results of this experiment (as they have been reported to date) suggest that video tape recording of counseling sessions when replayed and properly analyzed may have values both for a client as well as his counselor and that analysis of such tapes may have quasitherapeutic values of special importance to a disturbed client.

Some Suggestions for Future Research

Consistent with the trends in teacher education which have been projected, and assessments given of instructional media research implications for use of media in teaching as well as in the professional education of teachers, it is my view that the research most needed in the future is that which will study teacher roles functioning both within and as part of several systems and analyze the many components identified in terms of relevant systems theory. Such studies must be long-term, and they must in the future be more inclusive than has typically been the case.

Another area of instructional media research need and interest relates to problems of innovation--i.e., how to get new ideas tried, accepted and put into practice. Also, more studies should concentrate on building new bridges between theory and practice through developmental research. Or as Hilgard has expressed it in terms of the need for theory formulation, research is needed related to development of strategies in participation and decision-making so that:

(a) teachers may be more involved as responsible members of research teams, and

(b) representatives of the community may be involved early enough so that they are committed to make changes which may later be dictated by the results of research completed.

Since instructional media research literature is filled with suggestions for specific projects and studies concerning such topics as research methodology, content in relation to media, etc., there is no need to enlarge upon such recommendations in this paper. But with respect to one aspect of content versus media studies, an important point should perhaps be noted. The advent of instructional technology has made available new resources which, with increased refinement and ease of manipulation, may lead to devising some wholly new approaches in teaching in a number of basic content areas. For instance, in teaching languages, where modern technology now makes easy mastery of oral skills, attention is currently shifting within the field to developing greater interest in foreign cultures and toward efforts to bring about increased cross-cultural understanding. Instructional media are used here both to assist the gaining of knowledge about as well as the experience of the culture with a modest competence in language mastery assumed as being acquired along the way. In short, I believe there is a sense in which development of modern instructional technology can have some of the same effects of emancipating content fields by opening up new areas of exploration much in the same way that the cyclatron has opened the door to modern nuclear physics.

Of special importance to the future would be research concerning discovery methods as used in teaching and more extensive investigation of ways in which simulation devices can assist the preparation of teachers.

Assisted by computer controls, a large percentage of what today is rote memory work or learning involving skill mastery and repetition of intellectual as well as manual tasks can be automated and shifted to self-learning programs. Further research and experimentation is also needed in these areas.

Students of educational administration also require more guidance (which might be gained from suitable studies) than that which is presently available regarding optimum modes of administering educational programs; development of arrangements for scheduling classes; optimum utilization of faculties and learning resources. And, at least in more places than now exist, there must be established some new, wholly experimental programs which can serve as demonstration centers for teacher education "in the round" from recruitment through advanced studies and internships, not to mention cyclic retraining of those whose skills may need resharpening. Coupled with such demonstration programs could and should be developed major centers of instructional media research activity.

The Professional Education of Instructional Media Personnel

Instructional media responsibilities of teacher education programs include the preparation of specialists for management of media service, of teachers for use of new resources, of administrators for more understanding of how the resources are best deployed, as well as the preparation of subject matter personnel for application of media within specific subject fields. In recent years significant progress has been made in each of these areas. But, as suggested in the first few paragraphs of this paper, perhaps the most significant lack in the efforts to use the media--as it is also in the entire education enterprise--is the lack of an over-arching philosophy or theory to accommodate such disparate devices as a computer-organized classroom, a one-man study used for television projection, and a language laboratory . . . "Until some new philosophy emerges--and there are signs of its coming--the experimentation with machines to facilitate independent study, with electronic devices for storage and retrieval and the use of information, and with the use of electronic impulse to convey sound or color in education, will remain sporadic and episodic rather than as complementary attributes of a consistent educational effort. At the present, perhaps the only theorizing detectable is a wishful thinking that faculty time can be saved and that greater numbers of students can be accommodated in a possibly somewhat enlarged educational effort."[5] So writes Lewis B. Mayhew of Stanford University in a chapter which sums up roles of New Media in Higher Education in a valuable book of the same title edited by James W. Brown and James W. Thornton, Jr. of San Jose State College in California, published in 1963.

Teacher Education reflects the lack of a suitable theory or rationale, call it what you will, and appropriate definitions of the media field and its related responsibilities. There are, however, a number of efforts now being made to develop the needed philosophy and to plan for its embodiment in teacher education programs.

One set of keys to the breakthrough needed may be found represented in emerging designs for instructional media services and the philosophy which underlies them represented in programs established at the University of Miami in Coral Gables, at Stephens College in Missouri, at George Peabody College in Atlanta, Georgia, and in particular, at the new Division of Learning Resources at Florida Atlantic University.

The last has been justified as an agency having two primary functions: (1) to put at the disposal of the teaching faculty all media, technology, service and systems which will handle the effective communication of ideas in a pre-programmed phase of learning; and (2) to put at the disposal of the student all media, technology, services and systems which will enhance effective communication of ideas in a self-programmed phase of learning.

Given objectives such as these and development of the professional education programs needed to recruit and train personnel able to appreciate and carry out activities which would achieve such objectives, perhaps the need will begin to be met. The difficulty is that the present situation is one in which a common core or foundation approach is generally lacking, and stress is all too frequently laid on study of specific techniques and technology; that is to say that interest runs high in television, programmed instruction, and in computers and their capacities, or in the technologies of research in instruction and, in particular, routines, processes and systems of operation. The basic communication and information sciences from which all derive, as engineering applications, far too often are neglected.

It's a personal view that a wholly new definition is needed both of instructional media services required by schools and colleges and of the professional education needed to prepare teachers and specialists to use instructional media with effectiveness and efficiently. We are now working on these problems at the University of Pittsburgh. Indeed, they constitute the central focus of studies managed by the Center for . . . Media Studies.

Our evolving rationale can be expressed in these terms. Although massive in every dimension, the media problem can be stated simply. There is today no job of greater importance to progress in every sector of society than that of managing the availability and flow of knowledge through all media. This is the responsibility of the communication and information service professions. In areas concerned with distributive functions it is the responsibility shared with other groups by librarians and specialists in educational communication, information retrieval, and (increasingly) by computer personnel. There aren't enough individuals engaged in these occupations to meet the present requirement let alone satisfy future demands. Related programs of professional education are insufficient in number and ill-defined. A new integrative approach is mandatory; especially is this true for development of communication and information services needed by education.

Contemporary American schools, school systems, colleges and universities normally maintain all or most of the following instructional and research media service units clustered in various administrative arrangements: a textbook service; a library of printed materials; a film library; a collection of musical recordings; a collection of taped speeches as well as special radio programs; a library of kinescopes and videotapes for use on television; a campus radio station and/or television broadcast agency; closed-circuit TV facilities; new and special service agencies developed to produce locally materials needed for instruction; a university press; a photographic laboratory; a teaching machines center; a language laboratory; etc. Such units are normally managed by separate, specially trained personnel and tand to be competitive in their operations.

At present responsibility for recruiting and training individuals to work in specific jobs related to educational production, acquisition, organization, distribution and use of communication and information resources is dispersed widely. At the level of specialization, training responsibilities are normally divided among a number of colleges and curricula typically having such variant labels as these: Audio-Visual Education, Library Science, Radio and Television, Speech and Theatre Arts, Journalism, Fine Arts, Communications, Public Communications, Public Opinion, Editing and Publishing, Mass Communication, Documentation, Information Storage and Retrieval, Advertising, Public Relations, etc. While a measure of consensus has been achieved regarding what constitutes a profession, i.e., an intellectual technique and the application of that technique to practical affairs of men, agreement hasn't yet been reached concerning the number and kinds of professional jobs which actually exist in the field and for which special training must be provided. Chief among difficulties which compose the larger problem are those created by (1) the mass (or sheer bulk) of recorded knowledge and that which is being produced new every day in larger amounts and in all forms and formats, a mass for which all present techniques of control, technology and institutional service programs appear seriously inadequate; (2) the changing nature and requirements of the American educational system; (3) excessive subdivision of related programs in personnel recruitment and professional education, too many of which have been developed primarily in terms of routines, processes and technology, and suffer the lack of sound rationale.

The present degree of separatism which exists among educational communication and information service units and related professional training programs does not serve education well. The requirements of a modern school or university for instructional and research services call for having immediately at hand and available for use, singly or in any combination, the full spectrum of communications resources including all presentation media and related equipment, devices used for media analysis, information retrieval, etc. In the interest of improving instruction, coordinating resources, reducing the high cost of duplicating facilities, and avoiding inefficiency of management, improved communication and service arrangements are essential.

A rationale for such arrangements may be derived from redefinition of the various professional responsibilities involved. A cluster of six functions may be said to represent the chief communication and information service requirements of American schools and colleges (and, increasingly, these functions must be performed under single professional management). These six functions include the following: (1) continuing research and experimentation involving both instructional uses of media as well as the study of media service arrangements essential to satisfy the need; (2) local adaptation of teaching materials as well as production of new learning resources, taking into account any special requirements which specific media may have as well as the need for "conceptual interlock" (which, increasingly, must guide preparation of new materials in terms of their anticipated use in teaching); (3) distribution of all types of materials and equipment essential to aid the instruction and research effort of groups and individuals within the school or college communities; (4) counselling and training of individual teachers, students and student groups to identify their requirements and to improve media use; (5) demonstration and display services which would be more adequate than those normally provided in education under typical present-day arrangements (arrangements which frequently tend to place responsibility for such work in the office of a harried superintendent, principal or university functionary); (6) full use of modern computer technology which can be employed not only to solve problems of an advanced statistical nature and undertake information storage and retrieval work, but also to generate new instructional programs and by what amounts to massive data correlation, actually through synthesis create new knowledge by "intellectronic" processes.

Reflecting the six functions proposed, it is my opinion that specialists in educational communication as well as information services must have a common background of formal training. This training will not only include sound undergraduate preparation and thorough study of education as such, but in the fifth year and normally extending through sixth year levels and beyond (especially if one anticipates acceptance of a top management post, i.e., a supervisory job in a large school, school system, county or state agency), there must be properly represented basic study of learning and information theories, communication theory, institutions and processes; systems development and engineering, a thorough grounding in economics, research methods and statistical procedures; the administrative sciences; full opportunity to comprehend the range of media production arts, crafts and sciences; as well as development of capacities to appraise the methods and techniques of instruction.

Without going any further at this time to give details regarding the inter-relationships which I believe exist among the functions listed and the commonality of educational programs which should be developed to help prepare teachers to carry out these functions, let me state very simply that a new philosophy is evolving which integrates the media field in terms of educational need. This philosophy has major implications for teacher education programs, and some of these implications will be published shortly in a book to be issued next month by the Center for . . . Media Studies, entitled Professional Education of Media Service Personnel.[6]

In closing, let me add one point. Once having developed and accepted the type of rationale put forward, our thinking and research approaches have shifted ground somewhat to encompass the whole area of graduate study leading to careers in the communication and information service professions--a field which now, to my way of thinking, will not only include an evolving program in educational communication but must be grounded more generally in a new integrative program which will draw upon many parts of the University and call ultimately for development of a new University-wide approach to service, training and research in the communication and information sciences.

APPENDIX B -- A Note on Sources of Information Regarding Instructional Media Research

By definition, research on instructional media involves the study and investigation of materials and equipment used to assist the learning process. Whether or not those directly concerned with such studies are teachers themselves and the chief research locale is a school, college or university has little importance. The full body of instructional media research is relevant and has important implications for the process of teacher education; it must be reviewed as such.

Fortunately, there are available to assist the process of such review a number of bibliographic aids, guides and critiques--many of which have been published in recent years. Perhaps best known are the bibliographies on research in audiovisual education compiled by Dr. William Allen. Allen's Summary of Audiovisual Communication Research, prepared for publication in the Encyclopedia for Educational Research (1960), includes a comprehensive review of AV studies reported through 1958.

Although issued much less recently, in the area of instructional film research the work of Hoban and Van Ormer is still a classic which reports on work completed during the years 1918-1950.

The Inventory of Instructional Television Research, prepared by Hideya Kumata and first issued at the University of Michigan in 1948 reviews most of the significant TV research completed to the date of publication.

Dr. Wilbur Schramm, director of the Institute for Communication Research at Stanford University (under contract with the U. S. Office of Education) has compiled in recent years a number of major summaries of instructional media research and experimentation including a special report on Educational Television--the Next Ten years, issued by the Office in 1962.

This volume includes a chapter authored directly by Schramm which presents a comprehensive survey of implications of more than 400 studies of instructional uses of television.

Schramm also issued in 1963 an annotated guide on Reserach on Programmed Instruction. This bibliography may be close to exhaustive in its coverage, a remarkable feat when it is taken into account that the number of research papers prepared on programmed instruction published before 1960 was almost negligible by comparison with the field's explosion from 1960 to 1962.

Chapter XII on "Instruments and Media of Instruction", written by A. A. Lumsdaine of the University of California, Los Angeles, and published in the Handbook of Research on Teaching, issued in 1963, is a landmark survey of the field and of related research methodology.

Other valuable sources of information include the regular publishing programs maintained by the Department of Audiovisual Instruction of the National Education Association. Of importance to all who are interested in keeping up with this field is one journal in particular entitled Audio-visual Communication Review. This journal is issued bi-monthly by DAVI and is devoted to publication of serious and scholarly work in all areas of teaching and learning involving instructional uses of technology.

Also of notable importance is the publishing program supported by the Educational Media Branch of the U. S. Office of Education.

A continuing surveillance of research activities is maintained by the National Association of Educational Broadcasters, by the American Library Association, by the National Educational Television and Radio Center, and by the Educational Media Council. Each of these organizations compiles and issues for constituents late abstracts, summaries and reports of pertinent media research completed and in progress.

Other important sources of both new and secondary reports on research are the American Educational Research Association and the American Association of Colleges of Teacher Education. (The AACTE is presently carrying forward under auspices of Title VII, NDEA, its special TEAM project, i.e., Teaching and Educational Media.)

In short, growth in the instructional media field is well documented--(one might sometimes be tempted to say "too well documented" in terms of the total volume of publication in relation to its probable worth). However, thanks to stimulants administered in the form of large injections of Federal dollars by agencies interested in educational and military applications, a body of useful instructional media research data has been helped to develop and grow to many times its original size in a very few years. Under Part A of the Title VII program alone more than 225 separate research investigations have been supported since 1959, and perhaps 100 related dissemination projects were developed during the same period. The efforts of foundation-supported enterprise, industrial and commercial interests (notably those related to publishing and to audiovisual education) as well as work done by computer and data processing agencies and firms have also contributed to the field. But perhaps the largest original stimulus to research publication in the field was that fostered by some very large contracts awarded by defense-related and military agencies.

Useful bibliographic tools concerning instructional uses of media have also been developed from time to time by various universities, frequently growing out of work essential to completion of a specific research program or project. Of some interest in this regard are materials developed in recent years at Ohio University at Athens, at Syracuse University, the University of Wisconsin, the University of Missouri, the University of Pennsylvania, and others.

A potentially invaluable source of data concerning educational media research is that represented in the special "reservoir" established by the Center for Documentation and Communication Research at Western Reserve University. This project has been supported initially by the U. S. Office of Education. Western Reserve employs a variety of techniques including standard approaches to information storage and retrieval, and is presently receiving queries and delivering abstracts on an experimental basis to determine costs, worth, need and feasibility of maintaining instructional media research information services as part of a larger service unit. (The American Association of Colleges for Teacher Education and the Office of Education itself also have, either in planning stages or which have been advanced as proposals, some ideas concerning further development of research information service programs.) One other specialized information center from which one may obtain reports on instructional media research, as filed by government agencies, is the Bio-Science Information Exchange located in Washington, D. C.

* * * * * * * * * * * *

There follows a brief statement concerning references employed in preparing this paper and a listing of all items consulted.

Because of their direct relevance to this assignment, much material presented in papers delivered by Stone from 1962-64 has been adapted and included. The section on Trends in Teacher Education relies importantly on an unpublished address given at the University of Pittsburgh in the Spring of 1963 by Dr. Morris L. Cogan, chairman of the Department of Teacher Education. The author is also indebted to Thomas D. Clemens, Chief, Research and Services Section, Educational Media Branch, Office of Education for many informal discussions of the implications of media research and for his assessment of Title VII projects as these have implication for teacher training.

Of special value in recalling new media research and experimentation at the college level was the summary volume edited by Brown and Thornton on New Media in Higher Education.

1. Ryans, David G. "A Theory of Instruction with Special Reference to the Teacher: an Information Systems Approach." In Journal of Experimental Education, Winter, 1963. pp. 191-223.

2. Brown, James W. and James W. Thornton, Jr. New Media in Higher Education Washington, D. C., Association for Higher Education and the Division of Audio-Visual Instructional Service of the National Education Association, 1963. p. 174.

3. Cogan, Morris L. [Address on Teacher Education] Pittsburgh, Pennsylvania, University of Pittsburgh, 1963. (unpublished typescript).

4. Spring, Bernard T. "Plug-In Schools: Next Step in Educational Design." Architectural Forum, August, 1963. pp. 68-73.

5. Brown, op. cit. p. 174

6. Professional Education of Media Service Personnel (tentative title). Center for Library and Educational Media Studies, University of Pittsburgh Graduate Library School, 1964. (To be published in April, 1964)

****

Allen, William H. Audio-Visual Communication Research (Prepared for the 3rd edition of the Encyclopedia of Education Research). Santa Monica, Cal., System Development Corp., Sept. 20, 1958. 89 pp.

Berlo, David K. "Communication Theory and Audio-Visual Education," Audio-Visual Instruction, June, 1963. pp. 373-381.

Bushnell, Donald D. "The Role of the Computer in Future Instructional Systems," Audio-Visual Communication Review, Supplement VII, March-April, 1963.

Cyphert, Frederick R. and Spaights, Ernest. An Analysis and Projection of Research in Teacher Education. Columbus, Ohio, Ohio State University, College of Education, January, 1964. 85 pp. (unpublished draft--mimeographed).

Finn, James D. Technology and the Instructional Process (working paper prepared for the ASCD Seminar on The Theory of Instructional Materials). Washington, D. C., November 10-15, 1959. 23 pp.

Goldstein, Harold. ed. Proceedings on the National Conference on the Implications of New Media for the Teaching of Library Science, Sheraton-Chicago Hotel, Chicago, Illinois, May 27-29, 1963. Urbana, Illinois, University of Illinois Graduate School of Library Science, 1963, 233 pp.

Hoban, Charles F. "Duplication of Theory for Research in the New Media" (Working paper prepared for the Conference on Theory for the New Media) East Lansing, Michigan, Michigan State University, March 11-15, 1962.

Janowicz, Morris. "Social Theory and the New Media" (Working paper prepared for the Conference on Theory for the New Media) East Lansing, Michigan, Michigan State University, March 11-15, 1962.

Lumsdaine, A. A. "Instruments and Media of Instruction" In Gage, N. L. Handbook of Research on Teaching. Chicago, Rand McNally, 1963. pp. 583-682.

Meierhenry, Wesley C. "Learning Theory in A-V Utilization" A-V Communication Review, Supplement IV, Sept.-Oct., 1961.

Miller, Neal E. et al. "Graphic Communication and the Crisis in Education," A-V Communication Review, V, No. 3.....1957.

Nostrand, Howard L. A Second Culture: a New Imperative for American Education. Skytop, Pennsylvania, April 2-5, 1963. 59 pp. (working paper to be published in Proceedings of the Colloquium on Curricular Change: Doreign Languages. Sponsored by the College Entrance Examination Board)

A Project to Improve the Professional Sequence in Preservice Teacher Education Through The Selective Use of New Media. Washington, D. C., The American Association of Colleges for Teacher Education, December, 1963. 17 pp. (introductory report)

Review of Educational Research, 1962 (Theme--Instructional Materials; Educational Media and Methodology) since the issuance of Vol. XXVI, No. 2., April, 1956 211 pp.

Schramm, Wilbur, ed. Educational Television, The Next Ten Years. Stanford, The Institute for Communication Research, 1962. 375 pp.

New Teaching Aids for the American Classroom (a symposium on the state of research in instructional television and tutorial machines...) Stanford, Institute for Communication Research, 1960, 173 pp.

Research on Programmed Instruction, an annotated bibliography, Stanford, Institute for Communication Research, 1962 (mimeographed, first 24 pages numbered)

Singer, Len. "Florida Atlantic University" In Audio-Visual Instruction, April, 1963, pp. 236-242.

Stone, C. Walter. "A Design for Tomorrow in Education for Librarianship" In Proceedings on the National Conference on the Implications of New Media for the Teaching of Library Science, Sheraton-Chicago Hotel, Chicago, Illinois, May 27-29, 1963. Urbana, Illinois, University of Illinois Graduate School of Library Science, 1963. 233 pp.

"A New Design for Research in Library Education" In PLA Bulletin, November, 1963, Vol. 19, No. 2. pp. 11-17.

(ed.) *Instructional Television in Western Pennsylvania*, Center for Library and Educational Media Studies, University of Pittsburgh, Graduate Library School, 1964. (to be distributed by the University of Pittsburgh Book Center).

"The New Media in Education." In *Proceedings*, Meeting of Sub-committee on Educational Television, North Central Association, December 5-7, 1963, Chicago, Illinois (to be published in 1964).

Stone, C. Walter. "The School Library Materials Center" In *Proceedings*, Institute on the School Library as a Materials Center, Robert Allerton Park, Monticello, Illinois, Nov. 3, 1963 (to be published by the University of Illinois in 1964).

CHAPTER V

CONSPECTUS

This chapter presents a resume of the Conference discussions. As such, it explicates alternatives for action and indicates crossroads of decision for anyone attempting to chart a course for research in teacher education.

The content of the chapter is almost completely excerpted from tape recordings of the critical analyses which followed each formal paper. A number of themes reappeared throughout the deliberations. These have been summarized in whatever stage of development they ultimately reached. Insofar as possible, reporting is stressed and interpretation is avoided. Material from consultants' papers is duplicated only when the ensuing considerations significantly modified, extended, or emphasized the idea at issue.

The chapter is organized around four major divisions. The first, RESEARCH STATUS, summarizes salient points concerning the status of recent research efforts in teacher education. The second, RESEARCH TARGETS, highlights foci which hold promise for current and future teacher education research. The third, RESEARCH PROCESS, explains design and organizational suggestions intended to improve research in teacher education. The fourth and last division, CONCLUSION, contains the reactions and reflections of the project staff growing out of the total endeavor. The substance of the sections is not mutually exclusive; neither have efforts been made to provide written continuity between the summarized items.

Research Status

This section is concerned with the status of research in teacher education. It is an attempt to summarize and synthesize those phases of the Conference discussions that assessed and examined systematically extant research in teacher education. The passages which follow do not attempt to deal with "ends" or the "means" by which ends can be attained. Rather, this section is composed of summary statements of what is as well as what has been the research in teacher education of the past five years.

1. To some limited extent, research has had an impact on the education of teachers. One can readily see stronger emphasis being placed on the critical consumption of research reports for pre-service teachers. Still, few innovations in teacher education have been a direct result of research findings, and research techniques are seldom used in program process or evaluation. Thus, an incongruity is recognized. On one hand professors of education are attempting to encourage the incorporation of research results into actual teaching situations by stimulating their students to read and conduct research, and, on the other hand, most teacher education programs and program innovations are not based on research findings.

Two other points seem relevant when one considers the extent to which research has had impact on teacher education. First, research might have very little impact on teacher education programs nationally or regionally, and, at the same time have considerable influence upon practice at one institution. There are universities in this country that have continual research projects in teacher education, and many of the findings emanating from these efforts are most certainly put to use within those institutions. The second major point is that most research conducted in the past five years was not geared to produce change in teacher preparation. Rather, it was designed to stimulate further research.

2. A major consideration in assessing the impact of research in teacher education is whether or not the problems and status of such research are similar or dissimilar to the impact achieved by research in other professional areas of higher education, e.g., medical education, legal education, engineering education. It would seem that in these professional areas, as in teacher education, research related to the structure and content of the disciplines is essentially non-existent. Thus, research in teacher education, when viewed singularly, has had less than a monumental impact upon the education of teachers. However, when this impact is viewed in relation to that of the research efforts upon other professional fields, research in teacher education does not suffer by comparison. Research has apparently had little impact upon preparation curricula in any professional field.

3. Most of the research reported in teacher education over the past ten years has been primarily of the survey type. The findings usually are reported in percentages and rarely indicate comparisons. There is some question concerning the extent to which one can generalize from the results of a specific investigation since many of the studies reported were not representative of either teachers-in-training or practicing teachers. In a great many cases, the samples used were too restricted and limited; in still other cases, particularly in those in which the investigator

sought too extensive a contact, little mention was made of the sampling techniques employed. Since the majority of the normative studies reported were primarily of the terminal type, it would seem that some attempt should be made to verify and follow up the results. Perhaps in the process of follow-up, better designed procedures can be employed.

4. Relatively few experimental studies have been conducted in teacher education in the past ten years. Those studies which have been reported suffered from faulty instruments, uncontrolled criterion variables, and questionable composition of experimental and control groups.

Most research reports fail to answer the following questions: Are the measuring instruments biased in favor of a group undergoing a particular treatment? Are the important variables adequately controlled? If two groups are employed, are they randomly assigned, and, if so, in what manner? The area in which there was a predominant use of experimental research methodology was in Instruction and Field Experience, although even here the experimental designs were mainly of the single-factor, two-group type.

5. There is little doubt that both the results and the processes of research have had some impact on teacher education, but whether findings or processes are more important remains an unsettled issue. There are those who would contend that by merely engaging in the process of research greater benefits are accrued than from the products that may result from the activity. It is contended that the psychic and physical energy invested in research add dynamism to teacher education faculties and programs. On the other side of this issue, there are those who would contend that

only findings which are scientifically rooted have importance. It is posited that the scientific investigation on which results are based is important only to the extent that the process lends credence to the results.

6. Education faculty members have conducted more research in the past five years than in all previous years combined. There seem to be two undergirding reasons for this increased activity. First, universities have placed more emphasis on research as a criterion for promotion. It is no longer felt that the research function of colleges of education should be relegated solely to a research agency or bureau within the college. Many professors of education are expected to conduct research as a regular part of their academic duties. Secondly, more funds than ever before have been made available to finance research projects in and related to teacher education. Many teacher-educators, in an attempt to ensure financial support for their investigations, appear to structure their proposals in such a way that the possibility of their acceptance will be maximized.

7. Research in mass media as it relates to teacher education has received increasing attention. It consists largely of studies comparing the relative instructional or communicative efficiency of presentations using two or more media forms. The technical phases of instructional media expansion have received far greater attention from researchers than has the underlying basic communication science.

Research Targets

This section delineates general substance areas which appear promising for research by teacher educators. It contains responses relative to questions such as: What realms are most likely to produce significant knowledge? What questions should be investigated? What are appropriate initial or current foci for research in teacher education? While emphasis upon promising research process concepts is reserved for a subsequent section, it is readily acknowledged that this represents a distinction in thought and not a separation in existence.

1. A major concern of teacher education researchers centers around the question: What is the scope or boundary of the area with which teacher education research should be concerned? One point of view stresses the need to encompass all of the experiences that affect how a teacher teaches, i.e., their substantive areas, their general education, their personal characteristics, and their professional education. It is argued that to do less denies the obvious impact which each of these areas has upon how one teaches.

Many would accept this viewpoint as ultimately true, but stress the need for teacher educators to put their immediate house in order before concentrating upon other than those experiences for which they have direct responsibility and control. They reason that education as a field of study will never become a discipline, as it must, if it continues to be viewed as being as broad as life. Certainly teacher education is a portion of a larger body called professional education, which in turn lies in a still larger field called human knowledge. Research in education determines the content of professional courses and research in teacher education determines how this substance is to be applied in order to change the behavior of teachers.

2. A parallel issue deals with the nature of the substance of teacher education and the sources from which it comes. Those on one extreme of the continuum state that all teacher education content is the product of research in other social process fields, and that research in teacher education has the task of determining which knowledge in these fields has relevance for teachers, and how such knowledge can be reorganized.

The converse position is that the content of teacher education will be found completely within the present area labeled professional education, that this content is unique to education, and that it is generated through the study of education as an institution and as a process.

An intermediate position is that the content of teacher education can be derived in part from the behavioral sciences and in part from what is uniquely and exclusively professional education. Some advocates of this thesis call for cooperative team research efforts involving behavioral scientists and teacher educators. An example of non-existent research, which should be a part of the knowledge included in teacher education and which lends itself to cooperative development, relates to the structure of the disciplines in which teachers are being prepared to teach.

3. An additional point at issue is the relative efficiency of concentrating knowledge development activities on phenomena largely unexplicated or outside of teacher education curricula now, such as teacher and learner behavior, or focusing primary attention upon the validation or invalidation of the content presently existing in teacher preparation courses. The former approach into virtually virgin territory is now more feasible with the advent of new techniques and media. However, it involves ignoring much of what now exists, with its historical and logical rationale.

One's position on this question generally depends upon the amount of valid knowledge relevant to the education of teachers which he believes exists in current programs. Unfortunately, there is no available data on the question of the worth of current content superior to one's judgment from experience. An intermediate position is that by attacking the two targets simultaneously, an interchange of data would permit the work in each area to progress more effectively.

4. There was consensus among conference participants that knowledge, to be valid for teacher education programs, must be useful to teachers when teaching and to teacher educators when changing the behavior of prospective teachers. To illustrate, knowledge of concepts and how they are used in making judgments does not necessarily improve one's ability to make judgments. There is controversy and perplexity, moreover, concerning the most likely targets for producing knowledge with the characteristic of usefulness.

This concern for practicality generates the hypothesis that immediate teaching problems of practicing classroom teachers, studied in their natural setting, serve as research targets likely to generate information of a practical nature. Investigations of this type might also shed light on the question of the commonality and uniquenesses needed in the training of subject area or grade level specialists.

Others would suggest that researchers might well concentrate on ascertaining the utility of the great mass of information from the discipline of psychology that is presently not useful to teacher education. In any event, the promising areas for research efforts which follow should be measured by the criterion of the usefulness of the knowledge product.

5. Among the questions subject to research in teacher education are the following:

(a) What is valid content for teacher education?

(b) What should be the organization and placement of this knowledge?

(c) What are the most effective ways of teaching this content?

(d) What are ways of evaluating programs thus devised?

While many efforts have been directed toward questions _b_, _c_, and _d_, it appears obvious that question _a_ holds the key initial focus.

It was generally agreed by the Conference participants that there exists no identifiable body of research dealing with the selection of content for teacher education. The need for criteria by which dependable content can be measured is undeniable, and the need for research to validate this knowledge, the only legitimate basis for teacher education programs, is obvious.

Concomitantly, the nature of desirable teacher education content is open to discussion. Should it consist of concepts; are the relationships among concepts also a part of this content; is the formulation of concepts into means for classroom action yet another phase of content? The discussions reported have generally assumed the synonymity of knowledge and content, but the issue of how much of a teacher's professional acumen is the result of personal or private knowledge and how much results from public knowledge gives rise to the question of the extent to which experience as well as formalized knowledge is essential to the adequate preparation of teachers.

6. A high priority area among promising points of entry for the researcher in teacher education is that of teacher behavior. The history of research on teacher effectiveness shows that investigations have been directed toward identifying (1) what the teacher knows, (2) what the teacher is as a person, and (3) what the teacher values. From these data inferences have been made as to how the teacher will behave in the classroom. It is becoming increasingly apparent that the inverse of this sequence holds more promise for producing valid substance for teacher education. In specific terms, what a teacher does as he performs his tasks must be determined before the knowledge and experience needed in developing these teaching skills can be ascertained.

The most direct measures of this process will involve means or systems for recording behavior phenomena. Outcomes in terms of knowledge, attitudes, abilities, and skills should be considered high priority criteria in functional relationships involving teaching acts. The instructional setting, including materials, activities, and sequence of events may provide controls and variables for research designs. The same techniques that are used in studying teacher behavior on the job can be used in studying the student teaching process and what happens to student teachers during it. Different program emphases could be tried to see which produce the greatest changes in directions that appear, at our present state of knowledge, to be desirable.

7. Treatments, as defined by Smith, constitute an exciting source of valid content for teacher education. The effect of a treatment, i.e., a series of teacher behaviors having meaning as an entity, can be determined

descriptively. Knowledge of the differential impact of various treatments can lead to choices among treatments in accordance with varying instructional goals and conditions. Research on the validity of a treatment will need to be conducted apart from research concerning the competence or effectiveness of the teacher in the application of that treatment.

The assessment of a treatment can be made by measuring differential effects. This knowledge of treatments should become a significant part of the content of teacher education. Student teaching provides opportunities to study the application of previously validated treatments by prospective teachers.

8. Exploratory research is needed on education as a social institution and on the school as a social system. Current information on the former is primarily non-functional, and the latter has been largely ignored. The changing role of the teacher sociologically, the impact of sociological factors upon student bodies as our society becomes increasingly diverse and complex, and the effects of the social systems existing within the school upon both the teacher and the student are targets that hold promise for producing needed knowledge for teacher education. The education of teachers is relevant to what a school does and to what a school is sociologically as well as psychologically.

9. An additional target area is suggested by the research in fields whose knowledge has come largely from a study of the pathological and the atypical. Longitudinal research on individual teachers with emphasis upon those who fail, the causes of their failure, and the transformation of deficiencies into strengths can pay dividends as comparable studies have for

the field of medicine. Likewise, studying the behaviors of teachers of the handicapped, e.g., a teacher of the deaf, gives immediate feedback of the impact of that behavior. The judgment of effectiveness is real, and not clouded as it is with the teacher of a group of more typical children. The study of how the best teachers of the deaf behave, and how they learned that behavior, might produce rather quickly knowledge of import for all teachers.

10. A dilemma is presented by the fact that while the need to improve teacher education programs is widely recognized, most target areas will produce significant funds of knowledge only through extensive research efforts over long periods of time. Two partial solutions to this problem were discussed.

It was suggested that several colleges and schools of education should institute experimental teacher education programs with different foci or emphases. These programs should be conducted in such a way as to permit results to be compared and contrasted from one to another. The aim of such programs would be to clarify the relationship between program and product through research. The problem of preparing teacher educators for change through the results of research could be an additional target for inquiry.

A second area likely to produce relatively quick but dependable knowledge is that of student teaching. Its content is obviously valid, yet its dynamics have been researched in an unimaginative fashion.

11. Teacher education research has been concerned with limits and constraints instead of with an understanding of the dynamics involved. An

increased concern for the interactions involved in teaching appears likely to produce more usable knowledge.

Guidelines for locating interrelationships of high priority as research targets can be found in the diagram below:

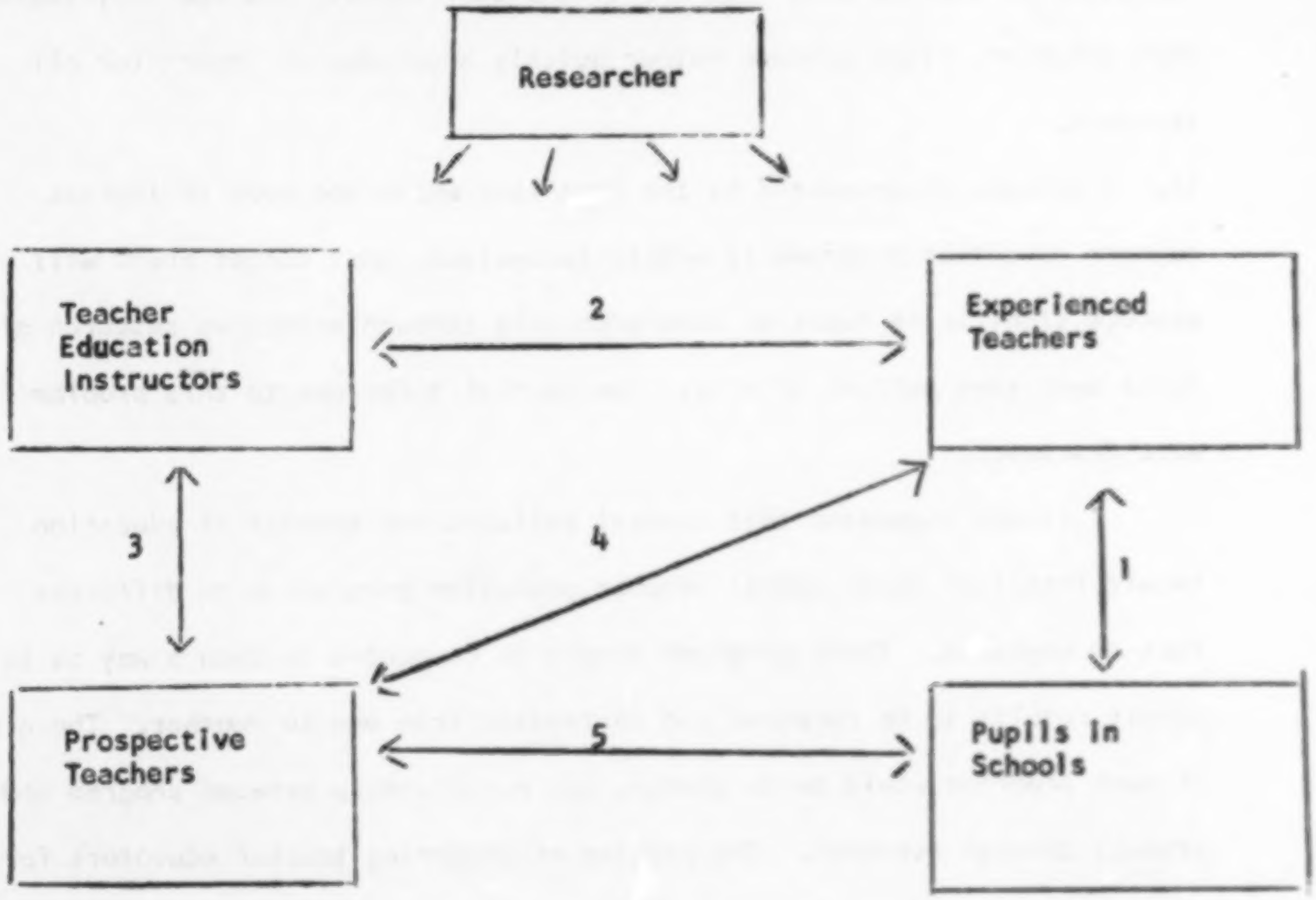

Researcher
Teacher Education Instructors
Experienced Teachers
Prospective Teachers
Pupils in Schools
1
2
3
4
5

Figure One

(a) First priority research should occur in relationship one, seeking to describe teacher behaviors viewed in relation to learning goals and behaviors of pupils.

(b) Second priority should be assigned to research of relationships two and three to learn about teacher educator behavior in relation to the learning of experienced and prospective teachers.

(c) Relationships four and five have obvious significance for major facets of the teacher preparation program.

(d) The major dividends occur, of course, when the relationships between teacher educator behavior and the behavior of teachers can be controlled to the degree that desired behavior in pupils is effected.

Research Process

This section highlights issues and promising practices in research design and procedures. It focuses upon the question "how should we proceed?" in extracting data from prime target areas for research in teacher education. It does not deal with specific techniques, but concentrates upon significant ideas concerning concepts of and approaches to research and investigation.

1. Conference participants spent considerable time discussing the merits of using a "macro" or broad theoretical frame approach to research in teacher education as this differs from a "micro" or specific problem orientation. The macro strategy develops theoretical speculations first, based upon appropriate models. The broad conceptual system is concerned largely with gross events of an educational nature, and the focus is applied continuously to smaller and smaller classes of phenomena. This

approach follows the thesis that right answers come from asking right questions, and these are consistently questions of great magnitude.

Advocates of a micro research stragegy claim that research can be initiated most productively at the lowest possible level of abstraction. Meaningful analysis is best achieved if events and relationships are reduced to the smallest possible unit. Thus, attention is focused upon the parts of a system, rather than on the system as a whole.

It was generally agreed that either initial strategy must eventually lead to the inclusion of the other approach, i.e., a beginning in theory ultimately deals with small segments of the research universe in order to produce valid data in specific circumstances, while microphase data from a series of limited targets must sometime be systematized through theory if it is to be generalizable or communicable. This essential interplay is required in order to refine concepts, develop assessment techniques, and create more powerful research designs.

A suggested beginning strategy is that of utilizing a miniature system approach to research design. This process consists of identifying limited systematized blocks of variables for investigation. This strategy has the advantage of permitting theory to play a major role, yet the restricted focus insures many of the advantages of the micro approach.

The teacher education researchers at this Conference expressed the opinion that little knowledge was available concerning the extent to which the point of entry into a research field influences the ultimate process or product. While the conferees did not recommend a given strategy as being most productive, it is interesting to note that in many sciences--

physics, sociology and economics being prime examples--the order of scientific progress has been that of "macro-mirco-macro."

2. The Conference participants expressed concern that faulty research design strategy has been a significant deterrent to the production of quantities of valid knowledge in teacher education. One shortcoming centers around the apparent inability of investigators to differentiate between exploratory research, which produces the kind of "soft" data needed when first probing a target area, and the well-controlled studies which extract "hard" data utilizing clues from the preceding studies. Many of the extant research efforts have used sophisticated designs and complex statistical treatments when simple procedures would have been sufficient; they have frequently imposed inappropriate designs upon problems because they were unsure of the general nature of the problem; they have failed to define and isolate variables clearly; and they have settled for a small effect from a large number of variables instead of seeking large main effects from a few crucial factors. The solution to these design weaknesses may well lie in the more extensive initial use of simple exploratory research, applying less complicated statistical procedures, and focusing upon a descriptive level and concentrating upon raising and clarifying questions rather than on eliciting answers.

A second suggested research process grows out of endeavors in allied social process fields. There, researchers have found it desirable to make a great number of studies of a single phenomenon. Some of these investigations are replications of prior work, while others focus on new areas of concern from varying directions and employing a variety of research methodologies. The investigators seek to maintain a theoretically consistent frame of reference so that the data can achieve conceptual interlock. Such strategies hold promise for producing much stronger knowledge than presently predominates in teacher education.

3. In the past, few researchers have been concerned directly with developing intermediate criteria for measuring the effectiveness of teacher education programs. It was posited by some Conference participants that instrumentation should be an integral part of teacher education research so that evaluation of the relationship between educational objectives and behavioral or attitudinal outcomes could be accomplished. The usual process in this type of evaluation is to select a group of prospective teachers who epitomize an extremity of value for the phenomena in question and then to record the characteristics of the criterion group so that any individual may be compared with them. This phase of the research might well be called the "pilot" stage. In the second stage, care must be taken to incorporate a standard within the measuring instrument in order that the results or scores can be used as evaluative symbols. Such a process would require that the contents of the measure discriminate between teachers who comprise the criterion group and people in general, or more specifically, pre-service teachers in general. It was suggested that once valid instruments are developed, which would indicate to teacher education researchers the degree of congruity that exists between program goals and student outcomes, concentrated attention could be placed on the experimental phenomena which would lead to desired goals. The Conference participants who aligned themselves with this idea expressed a preference

for the instrumentation of research studies to follow the descriptive or "armchair" phase of teacher education research.

Some Conference participants held that new and better instruments would stimulate research. Because of the unavailability of adequate instruments, many teacher educators are reluctant to conduct research. If intermediate instruments which would not require extensive observation on the part of the researcher were developed, the educator might be much more inclined to conduct research, particularly in the area of program or treatment evaluation.

4. The communication and understanding distance between the producer of knowledge and the applier of knowledge in education is increasing rapidly. This void causes problems for all concerned. To illustrate: What is known about learning was derived from a variety of circumstances, i.e., in a laboratory environment, using non-humans as subjects, etc. Yet, many teacher education faculty members know so little about the setting in which this knowledge was developed that they either (a) attempt to translate learning data directly into classroom practice, or (b) ignore these data because they appear to have little immediate practical use for teachers. Neither of these responses is desirable.

This general communications problem calls for a "middle man" whose focus of concern is with the interpretation or translation of knowledge. This person would conduct developmental research geared to determining the extent to which knowledge produced in a controlled environment has validity and relevancy when applied in an educational setting. Great value would be derived from the interpretation of the nature and conditions of knowledge use upon which further investigation could be based. At the moment, scholars who attempt to fill this role suffer the status disadvantage of belonging to neither the research nor the practitioner group.

5. Teacher educators appear to be discovering the potential of new communications media for improving research design. The use of computer programs which depict patterns, as well as sequences, within data permits the extraction of meaningful relationships heretofore virtually unobtainable. The ease with which classroom interaction can be recorded and studied in both its verbal and affective dimensions has enhanced the study of teacher behavior. Programming techniques permit the study of instructional phenomena without the contamination of a human teacher variable. The study of media as tools of research gives promise of making a major contribution to research process.

Conclusion

Some observations and reflections of the project staff to the total endeavor are in order. These remarks were not spoken at the Conference nor unearthed in the review of the literature, but they represent reactions derived from the process of planning and implementing the project.

1. In the initial stage of the project, the staff discovered that research in teacher education is not compiled in a single, comprehensive source. Staff members made a time-consuming but systematic canvass of periodicals, monographs, doctoral dissertations, data retrieval services, and standard reference works in an attempt to locate printed reports of teacher education research. The Journal of Teacher Education proved to be the most fruitful single source. Some of the studies abstracted in Chapter Two

were solicited directly from teacher-educators and researchers who permitted the inclusion of unpublished reports. Searches of this kind could be facilitated greatly if there existed indexes to teacher education research literature or continuing serial bibliographies.

2. Some of the Conference discussion was characterized by lack of common definition of vocabulary. Early in the Conference the observation was made that researchers were sometimes using terms differently than was common among teacher educators. Because of the difficulty of using a uniform language understandable to all, a communication problem was evident from time to time. Perhaps early in the Conference some effort should have been directed toward definition of terms.

3. It appears that conducting research on a wide scale basis will be most difficult. Although the Conference participants manifested a desire to expand research activity, their research interests were so diverse that no federated effort can be anticipated in the near future.

4. Despite the fact that they were among the nation's most knowledgeable teacher education researchers, some of the participants tended to center their discussion upon practices in teacher education rather than upon research in teacher education.

5. In reviewing the organizational pattern of the Conference, the staff has some concern about the extent to which structure can be imposed. It was necessary to restructure and modify the planned format throughout to accommodate the desires and unique ways of working characteristic of such a diverse and talented group of participants. Such modifications were satisfactory to all concerned.

6. It is hoped that the papers and summaries of research and discussions in this report will have heuristic value for years to come. Tied to the hope, however, there is the realization that translating discussion into action is a most difficult task. The Conference participants and project staff were agreed that the meeting was stimulating and thought-productive for all persons directly concerned. No one was confident, however, of logical follow-up activities for next steps. Perhaps it is the reader of this report who shoulders both the responsibility and the capability for transforming the ideas contained herein into fruitful teacher education research endeavors.

CONSULTANTS AND PARTICIPANTS

Dr. Mary Jane Aschner
Associate Professor of Education
Boston University
Boston, Massachusetts

Dr. John R. Beery
Dean, College of Education
University of Miami
Coral Gables, Florida

Dr. Robert N. Bush
Professor of Education
Stanford University
Stanford, California

Dr. Ray Collier
Professor of Educational Psychology
University of Minnesota
Minneapolis, Minnesota

Dr. Ned Flanders
Professor of Education
University of Michigan
Ann Arbor, Michigan

Dr. B. Harootunian
Associate Professor
University of Delaware
Newark, Delaware

Dr. Lawrence Haskew
Vice-Chancellor
University of Texas
Austin, Texas

Dr. Vernon Haubrich
Chairman, Department of Education
Western Washington State College
Bellingham, Washington

Dr. Glen Heathers
Coordinator for the Dual Progress Plan
New York University, Washington Square
New York City

Dr. Herbert F. LaGrone
Director, Teacher Education and
Media Project
The American Association of Colleges
for Teacher Education
Washington, D. C.

Dr. Richard E. Lawrence
Associate Secretary for Research
and Studies
The American Association of Colleges
for Teacher Education
Washington, D. C.

Dr. Elizabeth Maccia
Professor of Education
The Ohio State University
Columbus, Ohio

Dr. Donald M. Medley
Associate Professor
Division of Teacher Education
The City Universities of New York
New York City

Dr. David G. Ryans
Head, Center for Research in
System Development
System Development Corporation
Santa Monica, California

Dr. Robert Schaefer
Dean, Teachers College
Columbia University
New York City

Dr. B. Othanel Smith
Professor of Education
University of Illinois
Urbana, Illinois

Dr. C. W. Stone
Director, Center for Media Studies
University of Pittsburgh
Pittsburgh, Pennsylvania

Dr. Hilda Taba
Professor of Education
San Francisco State College
San Francisco, California

Dr. Robert M. W. Travers
Director, Bureau of Educational Research
University of Utah
Salt Lake City, Utah

Dr. Richard L. Turner
Associate Professor of
 Educational Psychology
Indiana University
Bloomington, Indiana

OBSERVERS

Dr. Robert Poppendieck
Department of Health,
 Education and Welfare
Office of Education
Washington, D. C.

Dr. Philip Rothman
Associate Professor of Education
Antioch College
Yellow Springs, Ohio

Dr. John B. Whitelaw
Department of Health,
 Education and Welfare
Office of Education
Washington, D. C.